



# ARAPAHOE BASIN SKI AREA PROJECTS DRAFT ENVIRONMENTAL IMPACT STATEMENT



JANUARY 2016

USDA Forest Service  
White River National Forest  
Dillon Ranger District



In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, office, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found [online](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: [program.intake@usda.gov](mailto:program.intake@usda.gov).

USDA is an equal opportunity provider, employer, and lender.

# **ABSTRACT**

## **DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE ARAPAHOE BASIN SKI AREA PROJECTS**

**WHITE RIVER NATIONAL FOREST  
DILLON RANGER DISTRICT  
SUMMIT COUNTY, COLORADO**

***JANUARY 2016***

**Lead Agency:** USDA Forest Service

**Responsible Official:** Scott Fitzwilliams, Forest Supervisor  
White River National Forest

**For Information Contact:** Matt Ehrman, Project Leader  
White River National Forest  
900 Grand Avenue  
Glenwood Springs, CO 81601  
mehrman@fs.fed.us

**Abstract:** This Draft Environmental Impact Statement (DEIS) has been prepared to analyze and disclose the estimated environmental effects of ski area projects proposed by Arapahoe Basin Ski Area (A-Basin). A-Basin is located on the White River National Forest in Summit County, Colorado and operates in accordance with the terms and conditions of a special use permit, which is administered by the United States Forest Service. The Proposed Action includes the following elements: incorporating the Beavers into A-Basin's operational boundary; development of the Beavers terrain, including ski trails and a chairlift; replacing the Molly Hogan and Pallavicini chairlifts; grading around the ridge above the top terminal of the Pallavicini chairlift; construction of the Zuma Access surface lift; removal of the Norway chairlift; and the addition of a canopy tour and a challenge course. Components of the Proposed Action are detailed in Chapter 2.

This DEIS discusses the Purpose and Need for the Proposed Action; potential direct, indirect, and cumulative impacts of implementing the alternatives; and project design criteria. Two alternatives are analyzed in detail in the DEIS: Alternative 1 (No Action) and Alternative 2 (the Proposed Action).

Comments on this DEIS will be accepted for 45 days from publication of the Notice of Availability (NOA) in the Federal Register. The NOA provides the sole means of calculating the close of the DEIS comment period.

**Important Notice:** Only those who submit timely and specific written comments will have eligibility to file an objection under 36 CFR §218.8. For objection eligibility, each individual or representative from each entity submitting timely and specific written comments must either sign the comment or verify identity upon request. Individuals and organizations wishing to be eligible to object must meet the information requirements in 36 CFR §218.25(a)(3). Comments received, including the names and addresses of those who comment, will become part of the public record for this project and will be subject to review pursuant to the Freedom of Information Act.

# **Executive Summary**

# EXECUTIVE SUMMARY

The proposed improvements analyzed in this document constitute a federal action, which has the potential to affect the quality of the human environment on public lands administered by the United States Forest Service (Forest Service). Therefore, these projects must be analyzed pursuant to the National Environmental Policy Act of 1969 (NEPA). Under NEPA, federal agencies must carefully consider environmental concerns in their decision making processes and provide relevant information to the public for review and comment.

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant federal and state laws and regulations. This DEIS contains analyses consistent with NEPA, Council on Environmental Quality (CEQ) regulations, and Forest Service policy. It discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment anticipated to result with implementation of the Proposed Action. Additionally, it is intended to ensure that planning considers the environmental and social values of the Project Area and that potential resource conflicts are minimized or avoided.

## **A. SUMMARY OF THE PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

The overall purpose of the proposed projects is to improve the guest experience and skier safety at the Arapahoe Basin Ski Area (A-Basin). It is not anticipated that the proposal would elicit increases in peak day visitation. The full text of the Purpose and Need is stated in Chapter 1. The following five statements summarize the Purpose and Need:

- Provide the Beavers with snow safety operations and ski patrol services consistent with statements made in the 2002 WRNF Forest Plan Final Environmental Impact Statement (FEIS).
- Accommodate existing and future demand for high alpine and open bowl skiing while protecting and enhancing the distinctive skiing experience that A-Basin provides.
- Improve access along the 400-foot, slightly uphill catwalk from Lenawee Mountain chairlift to Montezuma Bowl.
- Upgrade and remove chairlifts, as needed.
- Provide adventure-based multi-season experiences that require little specialized knowledge, skills, equipment or familiarity with the mountain environment.

## **B. SUMMARY OF THE ALTERNATIVES ANALYZED IN THIS DEIS**

This DEIS analyzes the No Action Alternative (analyzed in this document as Alternative 1) and the Proposed Action.

### **ALTERNATIVE 1 – NO ACTION**

By definition, the No Action Alternative represents a continuation of existing management practices without changes, additions, or upgrades to existing conditions.

### **ALTERNATIVE 2 – PROPOSED ACTION**

The Proposed Action includes the addition of approximately 338 acres of skiing terrain in the Beavers, construction of a new chairlift to access the Beavers terrain, a new surface lift to access Montezuma Bowl, replacement of the Molly Hogan and Pallavicini chairlifts, removal of the Norway chairlift, grading projects to improve operational efficiency and skier circulation, and construction of a canopy tour and challenge course. All proposed projects would be located within A-Basin's existing SUP area.

Components of the Proposed Action and details about modifications made in response to scoping comments are presented in Chapter 2, Section B – Alternative 2 – Proposed Action.

#### **Terrain**

The Proposed Action would expand A-Basin's operational boundary by approximately 492 acres and would result in approximately 338 additional acres of skiable terrain in the Beavers area, including:

- Approximately 26 acres of terrain (composed of 13 acres of intermediate and 13 acres of advanced intermediate terrain) across two traditional trails (B-2 and B-4)
- Approximately 24 acres of expert skiing terrain on two tree skiing trails (B-1 and B-3)
- Approximately 91 acres of open bowl skiing in Beaver Bowl
- Approximately 45 acres of expert level skiable terrain in tree skiing areas A, B, and C
- Approximately 153 acres of expert level tree skiing terrain in the Steep Gullies
- Emergency egress route to accommodate evacuation of injured skiers by A-Basin ski patrol and two picnic table decks are also included in the proposed terrain.

#### **Chairlifts**

The Proposed Action includes one new chairlift, one new surface lift, two chairlift replacements and the removal of one chairlift, including:

- Beavers chairlift to be installed as a fixed-grip (three- or four-person) chairlift serving intermediate, advanced intermediate, and expert terrain

- Zuma Access surface lift (approximately 360 feet long) to be installed on the traverse between the top terminal of the Lenawee Mountain chairlift and the top terminal of the Zuma chairlift
- Pallavicini and Molly Hogan chairlifts (including operator's shelters) replaced in their existing alignments with chairlifts with similar hourly capacities (1,200 and 1,000 people per hour, respectively) to the existing chairlifts
- Norway chairlift (including operator's shelters) removal

### **Pallavicini Grading**

- Grading project near the top terminal of the Pallavicini chairlift to facilitate the establishment of a seasonal "snow road"

### **Backcountry Access**

- Removal of three Forest Service-designated backcountry access points into the Beavers and creation of a designated backcountry access point to the Rock Pile

### **Ski Patrol**

- Expansion of the Snow Plume Refuge (approximately 300 square feet)
- New explosives magazine and makeup room near the top of the Steep Gullies

### **Multi-Season Recreation**

- Canopy tour on the front side of the ski area, descending from the Black Mountain Lodge to the base area
- Challenge course near the base area east of the Black Mountain Express chairlift within a series of tree islands

### **Forest Plan Amendment**

- A Forest Plan Amendment may be necessary due to a potential inconsistency identified between the Proposed Action and Standard ALL S1, pertaining to Canada lynx habitat connectivity

## **C. PUBLIC INVOLVEMENT**

A scoping notice, dated November 21, 2013, was mailed to approximately 50 community residents, interested individuals, public agencies, and other organizations. The information within the notice provided a brief description of the proposal, the Purpose and Need for action, and an illustrative map. This notice was specifically designed to elicit comments, concerns, and issues pertaining to the proposal. A Notice of Intent (NOI) to prepare an Environmental Impact Statement was published in the Federal Register on December 4, 2013. Comments were accepted from the following sources: email, web

submission, letter, public meetings, fax, and phone. During the scoping period, the WRNF received approximately 15 comment submittals.

All of the submittals were reviewed and comments were extracted and categorized by resource or topic. These comments were reviewed by the WRNF Interdisciplinary Team (ID Team) during and subsequent to the post-scoping ID Team meeting in August 2013. The ID Team used comment disposition codes to identify issues and to formulate potential alternatives to the Proposed Action in response to external (public and agency) and internal (WRNF) concerns. A summary of the identified resource issues are discussed below.<sup>1</sup>

## **D. SUMMARY OF RESOURCE ISSUES ADDRESSED**

Based on the results of Forest Service specialist review and public scoping, the Forest Service identified specific areas of concern. Each of the following issue statements includes a list of indicators (see Chapter 1), which were identified as a means of measuring or quantifying the anticipated level of impact on a particular resource.

### **HUMAN ENVIRONMENT**

#### **Recreation**

- The Proposed Action would convert hundreds of acres of popular backcountry terrain that is easily accessible from the ski area into lift-served terrain. Furthermore, lift-serving this area would alter the terrain distribution by ability level breakdown, and change skier circulation patterns throughout A-Basin's SUP area. These changes, combined with the addition of multi-season recreation opportunities (such as the canopy tour and challenge course), would change the recreational experience within the A-Basin SUP area.

#### **Social and Economic Resources**

- In both the short- and long-term, proposed projects could directly and cumulatively affect employment, schools, use of public/social services, and workforce housing in Summit County.

#### **Ski Area Access and Public Safety**

- Implementation of proposed projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic on Highway 6 and parking at A-Basin.

#### **Scenery**

- The Scenic Integrity Objective (SIO) of the A-Basin SUP area could be impacted through construction of the Beavers chairlift, trails, tree skiing areas, and cable-based multi-season recreation activities.

---

<sup>1</sup> The scoping comment disposition analysis is available in the project file.

## **Cultural Resources**

- Proposed ground disturbing activities have potential to affect known or unidentified cultural resources in the Analysis Area.

## **BIOLOGICAL ENVIRONMENT**

### **Vegetation and Botany**

- Ground disturbance associated with construction of proposed projects could affect plant communities throughout the Analysis Area, including Threatened, Endangered, and Sensitive (TES) species, WRNF Species with an Identified Viability Concern (SIVC), Species of Local Concern (SOLC), and invasive plant species.
- The majority of overstory vegetation associated with proposed ski terrain construction in the Beavers is Engelmann spruce and subalpine fir. Spruce bark beetle population buildup is a concern if spruce trees are cut and scattered in the understory of the forest canopy.

### **Wildlife and Aquatic Resources**

- Terrestrial TES, Management Indicator Species (MIS), and migratory birds could be affected by proposed ground disturbance, vegetation removal and increases in use associated with the Beavers projects and multi-season recreation activities.
- Increased annual visitation resulting from implementation of the Proposed Action would lead to more vehicles on Highway 6, which could impair Canada lynx movement.

### **Soils**

- Ground disturbance associated with construction of proposed projects has potential to increase erosion and soil compaction, and lower soil productivity through soil organic matter and mineral losses in the Analysis Area.

### **Water Resources**

- Implementation of terrain modifications associated with proposed projects (particularly vegetation removal and grading) has the potential to affect stream and riparian health.

### **Wetlands**

- Proposed ground disturbance and overstory vegetation removal has potential to affect wetland function and values within the Analysis Area.

## **E. SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

Table 2-4 found in Chapter 2 includes a summary comparison of environmental consequences, by resource, for Alternatives 1 and 2. Detailed information on affected environment and environmental consequences for each resource considered in this analysis can be found in Chapter 3.

# **Table of Contents**

---

# TABLE OF CONTENTS

<b>1. PURPOSE AND NEED .....</b>	<b>1-1</b>
A. INTRODUCTION .....	1-1
B. BACKGROUND.....	1-2
C. RELATIONSHIP TO PREVIOUS ANALYSES AND APPROVALS .....	1-3
D. PURPOSE AND NEED FOR THE PROPOSED ACTION .....	1-3
E. SUMMARY OF THE PROPOSED ACTION .....	1-6
<i>Alternative 2 – Proposed Action.....</i>	<i>1-6</i>
F. INTERAGENCY COORDINATION .....	1-6
G. PUBLIC INVOLVEMENT.....	1-7
H. RELEVANT CHANGES TO THE PROPOSED ACTION SINCE PROJECT SCOPING .....	1-7
I. ISSUES ANALYZED AND ISSUES DISMISSED.....	1-7
<i>Issues Analyzed .....</i>	<i>1-8</i>
<i>Resource Concerns Dismissed From Further Documentation in this DEIS .....</i>	<i>1-13</i>
J. SCOPE OF THE ANALYSIS .....	1-16
<i>Actions.....</i>	<i>1-17</i>
<i>Alternatives .....</i>	<i>1-17</i>
<i>Impacts .....</i>	<i>1-17</i>
K. CONSISTENCY WITH FOREST SERVICE POLICY .....	1-17
<i>WRNF Land and Resource Management Plan.....</i>	<i>1-17</i>
<i>2011 Ski Area Recreational Opportunity Enhancement Act .....</i>	<i>1-18</i>
<i>Forest Service Manual 2343.14 .....</i>	<i>1-20</i>
L. DECISION TO BE MADE.....	1-21
M. OTHER NECESSARY PERMITS, LICENSES, ENTITLEMENTS AND/OR CONSULTATION .....	1-22
<b>2. DESCRIPTION OF ALTERNATIVES.....</b>	<b>2-1</b>
A. INTRODUCTION .....	2-1
B. ALTERNATIVES CONSIDERED IN DETAIL .....	2-1
<i>Alternative 1 – No Action .....</i>	<i>2-1</i>
<i>Alternative 2 – Proposed Action (Modified).....</i>	<i>2-4</i>
C. PROJECT DESIGN CRITERIA INCORPORATED INTO ALTERNATIVE 2.....	2-12
D. ALTERNATIVES AND DESIGN COMPONENTS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS .....	2-21
<i>Original Proposed Action .....</i>	<i>2-21</i>
<i>Zip Line .....</i>	<i>2-21</i>
<i>Expanding Snowmaking Water Storage .....</i>	<i>2-21</i>
<i>No Chairlift Service with Improved Hike-Out of Beavers/Steep Gullies.....</i>	<i>2-22</i>
<i>Valley Floor Transportation Chairlift with Upgraded Pallavicini .....</i>	<i>2-22</i>
<i>Valley Floor to Top of Pallavicini Chairlift .....</i>	<i>2-23</i>
<i>Valley Floor to Top of Norway Chairlift.....</i>	<i>2-23</i>
<i>Two-Chairlift Configuration in the Beavers.....</i>	<i>2-24</i>
<i>Beavers Chairlift Without Terrain Improvements.....</i>	<i>2-24</i>
<i>Alternative Emergency Egress Route .....</i>	<i>2-24</i>
E. COMPARISON OF ALTERNATIVES .....	2-25
F. SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES .....	2-26
G. IDENTIFICATION OF THE PREFERRED ALTERNATIVE.....	2-36
<b>3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES.....</b>	<b>3-1</b>
<i>Scope of the Analysis.....</i>	<i>3-1</i>
<i>Affected Environment.....</i>	<i>3-1</i>
<i>Direct and Indirect Environmental Consequences.....</i>	<i>3-1</i>
<i>Cumulative Effects.....</i>	<i>3-2</i>
<i>Irreversible and Irretrievable Commitments of Resources.....</i>	<i>3-2</i>

## Table of Contents

---

A.	RECREATION .....	3-2
	<i>Scope of the Analysis</i> .....	3-2
	<i>Affected Environment</i> .....	3-2
	<i>Direct and Indirect Environmental Consequences</i> .....	3-6
	<i>Cumulative Effects</i> .....	3-13
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-15
B.	SOCIAL AND ECONOMIC RESOURCES .....	3-16
	<i>Scope of the Analysis</i> .....	3-16
	<i>Affected Environment</i> .....	3-16
	<i>Direct and Indirect Environmental Consequences</i> .....	3-20
	<i>Cumulative Effects</i> .....	3-22
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-23
C.	SKI AREA ACCESS AND PUBLIC SAFETY .....	3-24
	<i>Scope of the Analysis</i> .....	3-24
	<i>Affected Environment</i> .....	3-24
	<i>Direct and Indirect Environmental Consequences</i> .....	3-27
	<i>Cumulative Effects</i> .....	3-29
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-30
D.	SCENERY .....	3-30
	<i>Scope of the Analysis</i> .....	3-30
	<i>Forest Service Scenery Management System</i> .....	3-31
	<i>Affected Environment</i> .....	3-35
	<i>Direct and Indirect Environmental Consequences</i> .....	3-41
	<i>Cumulative Effects</i> .....	3-47
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-48
E.	CULTURAL RESOURCES.....	3-48
	<i>Scope of the Analysis</i> .....	3-48
	<i>Affected Environment</i> .....	3-49
	<i>Direct and Indirect Environmental Consequences</i> .....	3-50
	<i>Cumulative Effects</i> .....	3-50
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-51
F.	VEGETATION AND BOTANY.....	3-51
	<i>Scope of the Analysis</i> .....	3-51
	<i>Affected Environment</i> .....	3-51
	<i>Direct and Indirect Environmental Consequences</i> .....	3-58
	<i>Cumulative Effects</i> .....	3-62
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-63
G.	WILDLIFE AND AQUATIC RESOURCES .....	3-63
	<i>Scope of the Analysis</i> .....	3-63
	<i>Affected Environment</i> .....	3-63
	<i>Direct and Indirect Environmental Consequences</i> .....	3-75
	<i>Cumulative Effects</i> .....	3-82
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-84
H.	SOILS .....	3-84
	<i>Scope of the Analysis</i> .....	3-84
	<i>Forest Plan Direction</i> .....	3-84
	<i>Affected Environment</i> .....	3-86
	<i>Direct and Indirect Environmental Consequences</i> .....	3-89
	<i>Cumulative Effects</i> .....	3-94
	<i>Irreversible and Irretrievable Commitments of Resources</i> .....	3-96
I.	WATER RESOURCES .....	3-96
	<i>Scope of the Analysis</i> .....	3-96
	<i>Forest Plan Direction</i> .....	3-96
	<i>Affected Environment</i> .....	3-98
	<i>Direct and Indirect Environmental Consequences</i> .....	3-107

	<i>Cumulative Effects.....</i>	<i>3-111</i>
	<i>Irreversible and Irretrievable Commitments of Resources.....</i>	<i>3-112</i>
J.	WETLANDS .....	3-113
	<i>Scope of the Analysis.....</i>	<i>3-113</i>
	<i>Forest Plan Direction.....</i>	<i>3-113</i>
	<i>Executive Order 11990.....</i>	<i>3-114</i>
	<i>Affected Environment.....</i>	<i>3-114</i>
	<i>Direct and Indirect Environmental Consequences.....</i>	<i>3-118</i>
	<i>Cumulative Effects.....</i>	<i>3-120</i>
	<i>Irreversible and Irretrievable Commitments of Resources.....</i>	<i>3-121</i>
4.	<b>CONSULTATION AND COORDINATION .....</b>	<b>4-1</b>
A.	PREPARERS .....	4-1
	<i>Forest Service Team.....</i>	<i>4-1</i>
	<i>Consultant Team .....</i>	<i>4-1</i>
B.	AGENCIES, ORGANIZATIONS, TRIBAL GOVERNMENTS, AND PERSONS CONTACTED.....	4-3
	<i>Federal Government .....</i>	<i>4-3</i>
	<i>Tribal Government .....</i>	<i>4-3</i>
	<i>State Government .....</i>	<i>4-3</i>
	<i>Local Government.....</i>	<i>4-3</i>
	<i>Local Media .....</i>	<i>4-3</i>
	<i>Other Organizations.....</i>	<i>4-4</i>
	<i>Individuals Who Commented During Scoping or Who Have Participated in the NEPA Process .....</i>	<i>4-4</i>
5.	<b>REFERENCES.....</b>	<b>5-1</b>
6.	<b>FIGURES.....</b>	<b>6-1</b>
	Vicinity Map	
	Figure 1. Alternative 1 – No Action	
	Figure 2. Alternative 2 – Proposed Action	
	Figure 3. Alternative 1 – No Action	
	<i>Critical Viewpoint 1: Highway 6 (Lower) – Existing Conditions</i>	
	Figure 4. Alternative 2 – Proposed Action	
	<i>Critical Viewpoint 1: Highway 6 (Lower) – Visual Simulation</i>	
	Figure 5. Alternative 1 – No Action	
	<i>Critical Viewpoint 2: Highway 6 (Upper) – Existing Conditions</i>	
	Figure 6. Alternative 2 – Proposed Action	
	<i>Critical Viewpoint 2: Highway 6 (Upper) – Visual Simulation</i>	
	Figure 7. Alternative 1 – No Action	
	<i>Critical Viewpoint 3: Upper Chisolm – Existing Conditions</i>	
	Figure 8. Alternative 2 – Proposed Action	
	<i>Critical Viewpoint 3: Upper Chisolm – Visual Simulation</i>	
	Figure 9. Alternative 1 – No Action	
	<i>Critical Viewpoint 4: Base Area – Existing Conditions</i>	
	Figure 10. Alternative 2 – Proposed Action	
	<i>Critical Viewpoint 4: Base Area – Visual Simulation</i>	
7.	<b>GLOSSARY .....</b>	<b>7-1</b>
8.	<b>INDEX .....</b>	<b>8-1</b>
<b>APPENDICES</b>		
	Appendix A: Cumulative Effects Projects	
	Appendix B: Forest Plan Amendment	
	Appendix C: Forest Service Manual 2343 Screening Report	

## LIST OF TABLES

Table 1-1: Lift-Served Terrain Distribution by Ability Level – Existing Condition .....	1-5
Table 2-1: Alternative 2 Terrain Breakdown.....	2-5
Table 2-2: Project Design Criteria and Best Management Practices .....	2-13
Table 2-3: Summary Comparison of Projects – Alternatives 1 and 2.....	2-25
Table 2-4: Summary Comparison of Direct and Indirect Environmental Consequences .....	2-26
Table 3A-1: Lift-Served Terrain Distribution by Ability Level – Existing Conditions.....	3-4
Table 3A-2: Lift-Served Terrain Distribution by Ability Level – Alternative 2 .....	3-8
Table 3B-1: A-Basin Baseline Employment.....	3-16
Table 3B-2: Population and Housing Units in Summit County 2015.....	3-18
Table 3B-3: A-Basin New Employment – Alternative 2.....	3-20
Table 3C-1: Existing Parking Capacities.....	3-26
Table 3F-1: Federally Listed and Proposed Plants for Summit County, Colorado.....	3-53
Table 3F-2: R2 Sensitive Plant Species .....	3-53
Table 3F-3: Disturbance by Vegetation Type – Alternative 2.....	3-59
Table 3F-4: Summary of Potentially Affected R2 Sensitive Plant Species .....	3-61
Table 3F-5: Impact Summary for SOLC under Alternative 2 .....	3-61
Table 3G-1: Threatened, Endangered, and Proposed Wildlife Species .....	3-64
Table 3G-2: Lynx Habitat in the A-Basin SUP Area.....	3-66
Table 3G-3: R2 Sensitive Species .....	3-70
Table 3G-4: Management Indicator Species.....	3-71
Table 3G-5: USFWS Birds of Conservation Concern .....	3-72
Table 3G-6: Effects to R2 Sensitive Species – No Action and Proposed Action .....	3-79
Table 3H-1: Soils Guideline 1 – Ground Cover Requirements .....	3-85
Table 3H-2: General Characteristics of Mapped Soil Units .....	3-87
Table 3H-3: Project Disturbance .....	3-91
Table 3I-1: Study Watersheds Description .....	3-100
Table 3I-2: Study Watersheds – Existing Conditions .....	3-100
Table 3I-3: WRENS Model Output for Baseline and Existing Conditions – Average Precipitation .....	3-101
Table 3I-4: Stream Health Classes for Attainment of Forest Plan Standards (WCPH) .....	3-102
Table 3I-5: Impacts to WIZ – Existing Conditions .....	3-104
Table 3I-6: Stream Health Summary for North Fork Snake River downstream from A-Basin.....	3-105
Table 3I-7: Roads Connected to the Stream Network – Existing Conditions.....	3-106
Table 3I-8: Connected Disturbed Areas – Existing Conditions.....	3-106
Table 3I-9: Summary of Proposed Projects per Watershed .....	3-107
Table 3I-10: Comparison of Existing and Proposed Forest Clearing <sup>a</sup> .....	3-108
Table 3I-11: Estimated Changes to Watershed Yield.....	3-108
Table 3I-12: Estimated Changes to Peak Flow .....	3-109
Table 3I-13: Impacts to WIZ under the Proposed Action.....	3-110
Table 3I-14: North Fork Snake River Watershed – Condition Indicators .....	3-112
Table 3J-1: Qualitative Wetland Assessment Rankings .....	3-116
Table 3J-2: Analysis Area Wetland Assessment Summary .....	3-117
Table 3J-3: Wetland Impact Summary – Proposed Action.....	3-120

## LIST OF PHOTOS

Photo 3A-1: Steep Gullies Terrain .....	3-3
Photo 3D-1: View of the Beavers from Near the Top of Pallavicini Chairlift.....	3-37
Photo 3D-2: View of Steep Gullies from Highway 6 .....	3-37
Photo 3D-3: View Towards Zuma Chairlift from Lenawee Mountain Chairlift Top Terminal .....	3-38
Photo 3D-4: View of Top Terminal of Pallavicini Chairlift and Proposed Grading Area.....	3-40
Photo 3D-5: View to Northwest from Snow Plume Refuge .....	3-40
Photo 3D-6: Example of a Fixed-Grip Chairlift Terminal.....	3-42
Photo 3D-7: Example of Explosive Makeup Room with Solar Panel .....	3-44

## LIST OF CHARTS AND MAPS

Chart 3F-1: Relative Acreage of Vegetation Cover Types within A-Basin’s SUP Area.....	3-52
Map 3G-1: Lynx Landscape Connectivity in Southern Summit County .....	3-68
Map 3H-1: Forest Service Stability Model and Soil Map Units.....	3-90

## LIST OF ACRONYMS

AADT	Average Annual Daily Traffic	ROD	Record of Decision
ADT	Average Daily Traffic	SAROE	Ski Area Recreational Opportunity Enhancement Act of 2011
APE	Area of Potential Effect	SCRG	Summit County Rescue Group
BA	Biological Assessment	SHPO	State Historic Preservation Officer
BE	Biological Evaluation	SIO	Scenic Integrity Objective
BEIG	Built Environment Image Guide	SIVC	Species with an Identified Viability Concern
BMP	Best Management Practice	SMS	Scenery Management System
CCC	Comfortable Carrying Capacity	SOLC	Species of Local Concern
CDA	Connected Disturbed Area	SRLMD	Southern Rockies Lynx Management Direction
CDOT	Colorado Department of Transportation	SUP	Special Use Permit
CEQ	Council on Environmental Quality	TES	Threatened, Endangered, and Sensitive species
CFR	Code of Federal Regulations	USACE	U.S. Army Corps of Engineers
CFS	Cubic Feet per Second	USC	United States Code
CPW	Colorado Parks and Wildlife	USDA	United States Department of Agriculture
CRA	Colorado Roadless Area	USFWS	U.S. Fish and Wildlife Service
CSCUSA	Colorado Ski Country USA	USGS	U.S. Geological Survey
CWA	Clean Water Act	WCPH	Watershed Conservation Practices Handbook
DAU	Data Analysis Unit	WIZ	Water Influence Zone
dbh	Diameter at Breast Height	WOUS	Waters of the United States
DEIS	Draft Environmental Impact Statement	WRNF	White River National Forest
EIS	Environmental Impact Statement		
EPA	Environmental Protection Agency		
EO	Executive Order		
ESA	Endangered Species Act		
FEIS	Final Environmental Impact Statement		
FSH	Forest Service Handbook		
FSM	Forest Service Manual		
GHG	Greenhouse Gas		
GIS	Geographic Information System		
ID Team	Interdisciplinary Team		
LAU	Lynx Analysis Unit		
LWD	Large Woody Debris		
MAII	May Adversely Impact Individuals		
MDP	Master Development Plan		
MIS	Management Indicator Species		
MOU	Memorandum of Understanding		
NEPA	National Environmental Policy Act		
NFS	National Forest System		
NHPA	National Historic Preservation Act		
NI	No Impact		
NRHP	National Register of Historic Places		
NOI	Notice of Intent		
PDC	Project Design Criteria		
PEM	Palustrine Emergent		
PFO	Palustrine Forested		
PPSL	Peak Period Shoulder Lane		
PSS	Palustrine Scrub-Shrub		
R2	Region 2		

# Chapter 1

## Purpose and Need

---

# 1. PURPOSE AND NEED

## A. INTRODUCTION

The proposed improvements analyzed in this document constitute a federal action, which has the potential to affect the quality of the human environment on public lands administered by the United States Forest Service (Forest Service). Therefore, these projects must be analyzed pursuant to the National Environmental Policy Act of 1969 (NEPA). Under NEPA, federal agencies must carefully consider environmental concerns in their decision making processes and provide relevant information to the public for review and comment.

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant federal and state laws and regulations. This DEIS contains analyses consistent with NEPA, Council on Environmental Quality (CEQ) regulations, and Forest Service policy. It discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment anticipated to result with implementation of the Proposed Action. Additionally, it is intended to ensure that planning considers the environmental and social values of the Project Area and that potential resource conflicts are minimized or avoided. The document is organized into eight chapters, plus three appendices:

- **Chapter 1 – Purpose and Need:** includes information on the history of the project proposal, the purpose of and need for the project, and the proposal for achieving that Purpose and Need. Chapter 1 details how the Forest Service informed the public of the proposal and how the public responded. Chapter 1 also describes issues raised through the scoping process.
- **Chapter 2 – Description of Alternatives:** provides a detailed description of the No Action Alternative and the Proposed Action that are analyzed in detail in this document. This discussion also includes alternatives considered but eliminated from further analysis and project design criteria (PDC). Finally, Chapter 2 provides a summary table of the environmental consequences anticipated with each alternative.
- **Chapter 3 – Affected Environment and Environmental Consequences:** provides a description of the affected environment (i.e., existing conditions) by resource area, and describes the environmental effects of implementing the No Action Alternative and the Proposed Action. Chapter 3 is organized by resource topic.
- **Chapter 4 – Consultation and Coordination:** provides a list of preparers and agencies consulted during the development of this DEIS.
- **Chapter 5 – References:** provides complete references for documents cited within this DEIS.
- **Chapter 6 – Figures:** provides the maps, figures, visual simulations, and perspectives used throughout the analysis.

- **Chapter 7 – Glossary:** provides a definition of technical and non-technical terms used throughout this DEIS.
- **Chapter 8 – Index:** provides a list and page number of frequently used terms throughout this DEIS.
- **Appendices** – includes: (A) Cumulative Effects Projects; (B) Forest Plan Amendment; and (C) Forest Service Manual 2343 Screening Report.

Additional documentation, including more detailed analyses of Project Area resources, may be found in the project file located at the Dillon Ranger District office of the White River National Forest (WRNF).

## **B. BACKGROUND**

Arapahoe Basin Ski Area (A-Basin) is located in the Dillon Ranger District of the WRNF, 15 miles east of Dillon, Colorado. A-Basin is approximately 1.5 to 2 hours driving time from the metropolitan Denver area via Interstate 70 (I-70) and Highway 6 (refer to the Vicinity Map in Chapter 6). It can be accessed via Highway 6 from the west through the Town of Dillon or from the east from Loveland Pass.

A-Basin is owned by Dundee Realty USA, LLC, and operates under a Forest Service Ski Area Term Special Use Permit (SUP). A-Basin's SUP covers approximately 1,872 acres of National Forest System (NFS) lands, which encompass 100 percent of the ski area's chairlift/terrain network, parking facilities, infrastructure, and guest services.

A-Basin has evolved over the decades since its inception in 1946 by adding new chairlifts, new and improved ski terrain, additional parking and day lodge facilities. The existing developed trail network at A-Basin accounts for a total of approximately 958 acres of skiable terrain and accommodates the entire range of skier ability levels from beginner to expert. A-Basin's terrain is comprised of 676 acres of lift-served skiing and approximately 282 acres of hike-to/hike-back terrain accessible from the Pallavicini, Lenawee Mountain (the East Wall), and Zuma chairlifts. A-Basin currently operates one high speed quad chairlift (Black Mountain Express), one quad fixed-grip (Zuma), one triple chairlift (Lenawee Mountain), three double chairlifts (Pallavicini, Norway, and Molly Hogan), and two conveyor lifts. Additionally, A-Basin operates base area guest services facilities, and provides on-mountain guest services at the Black Mountain Lodge.

A-Basin's SUP requires the development of a Master Development Plan (MDP), which identifies management direction and opportunities for future management of the ski area on NFS lands. In September 1999 via a NEPA review process, the Forest Service approved the 1997 MDP for A-Basin, which identified, among other things, improvements to chairlifts and guest services, snowmaking infrastructure and parking. In subsequent years, the 1997 MDP was revised multiple times and culminated in the 2012 MDP. The 2012 MDP was accepted by the WRNF and includes a list of proposed projects that, if analyzed and approved through the NEPA process, generally could be implemented in five to ten

years. Major components of the 2012 MDP include upgrades to existing chairlifts, a mid-station for the Lenawee Mountain chairlift, increased snowmaking infrastructure, development of a tubing park, an additional surface lift, and upgrades to base area buildings. All of the projects analyzed in this DEIS were initially addressed in the 2012 MDP; however, not all of the projects included in the 2012 MDP are included in this DEIS for review.

## **C. RELATIONSHIP TO PREVIOUS ANALYSES AND APPROVALS**

This DEIS is consistent with and incorporates by reference several documents which are related to the management of A-Basin on NFS lands, including:<sup>1</sup>

- 2002 White River Land and Resource Management Plan (Forest Plan) Final Environmental Impact Statement (FEIS) and Record of Decision (ROD)
- 2006 A-Basin Improvement Plan FEIS and ROD
- 2012 A-Basin MDP

## **D. PURPOSE AND NEED FOR THE PROPOSED ACTION**

The WRNF has prepared this DEIS in response to A-Basin's request to implement projects from their accepted 2012 MDP. The overall purpose of the proposed projects is to improve the guest experience and skier safety at the ski area.<sup>2</sup> The Purpose and Need is described in the following paragraphs.

### **Purpose and Need**

**In order to meet the needs and expectations of existing and potential guests and provide a safe skiing experience, the WRNF, through its acceptance of A-Basin's 2012 MDP, has identified a need to:**

- **Provide the Beavers with snow safety operations and ski patrol services consistent with statements made in the 2002 WRNF Forest Plan FEIS.**
- **Accommodate existing and future demand for high alpine and open bowl skiing while protecting and enhancing the distinctive skiing experience that A-Basin provides.**
- **Improve access along the 400-foot, slightly uphill catwalk from Lenawee Mountain chairlift to Montezuma Bowl.**
- **Upgrade and remove chairlifts, as needed.**

---

<sup>1</sup> These documents are part of the project file for this DEIS and are available for review at the Dillon Ranger District.

<sup>2</sup> The terms "skier," "skiing," "ski," "ski trail," and "skiable," as used within this document, are expressly inclusive of all forms of alpine on-snow recreation including: snowboarding, telemark skiing, adaptive skiing, and other forms of allowable on-snow sliding.

- **Provide adventure-based multi-season experiences that require little specialized knowledge, skills, equipment or familiarity with the mountain environment.**

**1) Provide the Beavers with snow safety operations and ski patrol services consistent with statements made in the 2002 WRNF Forest Plan FEIS.**

Dating back to 1982, six avalanche fatalities have occurred in the backcountry immediately adjacent to A-Basin's operational boundary—five in the Steep Gullies and one in the Beavers. Currently, the Beavers can be accessed legally through backcountry access points located along the western extent of A-Basin's operational boundary.<sup>3</sup> From these points, skiers may exit the controlled/patrolled portions of A-Basin's operational boundary to access adjacent unpatrolled and uncontrolled backcountry terrain in the Beavers, the Steep Gullies, and the Rock Pile. In particular, these areas receive heavy backcountry use by the public once the snowpack is sufficient.

Documentation of the popularity of the Beavers can be traced back to the 2002 WRNF Forest Plan FEIS, Chapter 3, p. 3-458, which provides detailed information on "Future Expansion" areas at existing ski areas across Eagle, Garfield, Pitkin, and Summit counties. Regarding A-Basin's SUP area, and specifically planned projects discussed in this DEIS, the 2002 Forest Plan FEIS states:

*"The Beavers are popular with backcountry skiers and snowboarders who access the site from Arapahoe Basin ski area. Steep north-facing chutes above treeline with numerous rock outcrops characterize the terrain. Most skiers hike or hitchhike uphill to return to their vehicles. Avalanche risk to the public is potentially high. The risk could be partially mitigated if the Beavers site was developed for skiing as part of the ski area"*<sup>4</sup>

Incorporating the Beavers into A-Basin's operational boundary would provide the area with snow safety operations and ski patrol services consistent with statements made in the 2002 Forest Plan FEIS.

**2) Accommodate existing and future demand for high alpine and open bowl skiing while protecting and enhancing the distinctive skiing experience that A-Basin provides.**







A-Basin's market is unique in that it is strongly skewed toward advanced ability level (intermediate, advanced intermediate, and expert) skiers as compared to the majority of ski resorts in the Central Rocky Mountain region, who primarily accommodate intermediate skiers. In order to meet the expectations of guests and maintain and improve its reputation for advanced terrain with low trail densities, there is a need for A-Basin to develop additional terrain within the existing SUP area. Table 1-1 illustrates that there is currently a deficiency of expert and intermediate terrain at A-Basin.

---

<sup>3</sup> Atkins, 2015; Unless otherwise noted, and for the purposes of this analysis, "the Beavers" incorporates Beaver Bowl, the Steep Gullies, and all associated tree skiing.

<sup>4</sup> USDA Forest Service, 2002b

**Table 1-1:  
Lift-Served Terrain Distribution by Ability Level – Existing Condition**

Skier/Rider Ability Level		Trail Area (acres)	Skier/Rider Capacity (guests)	Skier/Rider Distribution (%)	A-Basin Market (%)
	Beginner	1.6	57.1	1	2
	Novice	26.8	669.3	16	7
	Low-Intermediate	46.1	738.2	17	18
	Intermediate	67.0	670.4	16	20
	Advanced-Intermediate	263.4	1,316.9	31	30
	Expert	270.9	812.7	19	23
<b>TOTAL</b>		<b>675.9</b>	<b>4,264</b>	<b>100</b>	<b>100</b>

**3) Improve access along the 400-foot, slightly uphill catwalk from Lenawee Mountain chairlift to Montezuma Bowl.**

Currently, skiers/riders looking to access Montezuma Bowl from the Lenawee Mountain and Norway chairlifts must skate or hike a 400-foot long, slightly uphill catwalk. Moving along this catwalk is especially difficult in fresh snow or on windy days. There is a need to improve skier circulation at this location.

**4) Upgrade and remove chairlifts, as needed.**

There is a need to improve the operational efficiency and reliability of the chairlift network. The Pallavicini and Molly Hogan chairlifts, both installed in 1978, have successfully operated for 35 years but are reaching the end of their operational life. Both chairlifts provide out-of-base access to important terrain and are highly trafficked through the operational season. The Molly Hogan chairlift provides the imperative first chairlift opportunity for beginner and novice guests before moving onto the Black Mountain Express (a high-speed detachable quad chairlift located in the base area). Molly Hogan's operation is key to capturing the full spectrum of skier ability levels. Pallavicini sees even greater use as it provides access to a large pod of expert-level terrain, as well as backcountry access points. The Norway chairlift, also installed in 1978, services redundant terrain with the Lenawee Mountain chairlift and its operational efficiency is greatly reduced. This chairlift only operates during peak weekends and holidays.

**5) Provide adventure-based multi-season experiences that require little specialized knowledge, skills, equipment, or familiarity with the mountain environment.**

Public interest in multi-season recreation activities has increased substantially in recent years, and activities have evolved to include a significant variety of opportunities and user experiences. In Summit County in particular, multi-season recreation has become very popular and there is a significant demand for outdoor recreational activities suitable for a wide range of ages, abilities, and experience levels. Multi-season recreation activities on NFS lands within A-Basin's SUP provide an opportunity for guests to use

and enjoy public lands. The goal of multi-season recreation activities at A-Basin is to introduce guests to the WRNF and encourage outdoor recreation and enjoyment of nature. A-Basin desires to provide a recreational experience that reduces the barriers that can be associated with recreating in a mountain environment.

The Ski Area Recreational Opportunity Enhancement Act of 2011 (SAROE) provides authority for mountain resorts operating on NFS lands to offer an expanded range of outdoor recreation activities in order to further recreational opportunities for the public, allow year-round utilization of existing resort facilities and stimulate job creation and economic growth within local communities. The proposed projects align with the intent of SAROE, which is discussed in greater detail in Section K – Consistency with Forest Service Policy of this chapter.

### **E. SUMMARY OF THE PROPOSED ACTION**

The projects analyzed in this DEIS are designed to address the Purpose and Need described above. This DEIS was assembled to enable the Responsible Official to determine whether or not all, portions of, or alternatives to the Proposed Action will be approved for implementation on NFS lands within A-Basin's SUP area.

Subsequent to scoping, the Proposed Action was modified in relation to issues raised internally by the WRNF and externally by the public during the scoping process. Specifically, the amount of tree removal for skiing terrain in the Beavers has been reduced. Additional information is provided in Chapter 2.

A summary of the Proposed Action is provided here, with a detailed description presented in Chapter 2.

### **ALTERNATIVE 2 – PROPOSED ACTION**

The Proposed Action includes the addition of approximately 338 acres of skiing terrain in the Beavers, construction of a new chairlift to access the Beavers terrain, a new surface lift to access Montezuma Bowl, replacement of the Molly Hogan and Pallavicini chairlifts, removal of the Norway chairlift, grading projects to improve operational efficiency and skier circulation, and construction of a canopy tour and challenge course. All proposed projects would be located within A-Basin's existing SUP area.

Components of the Proposed Action and details about modifications made in response to scoping comments are presented in Chapter 2, Section B – Alternative 2 – Proposed Action.

### **F. INTERAGENCY COORDINATION**

In accordance with regulatory direction, and in furtherance of cooperative management among federal agencies charged with oversight of environmental and natural resources; federal, state, local, and tribal entities with a likely interest and/or jurisdiction in the Proposed Action were sent scoping notices and/or consulted prior to and throughout the NEPA process.

## **G. PUBLIC INVOLVEMENT**

A scoping notice, dated November 21, 2013, was mailed to approximately 50 community residents, interested individuals, public agencies, and other organizations. The information within the notice provided a brief description of the proposal, the Purpose and Need for action, and an illustrative map. This notice was specifically designed to elicit comments, concerns, and issues pertaining to the proposal. A Notice of Intent (NOI) to prepare an Environmental Impact Statement was published in the Federal Register on December 4, 2013. Comments were accepted from the following sources: email, web submission, letter, public meetings, fax, and phone. During the scoping period, the WRNF received approximately 15 comment submittals.

All of the submittals were reviewed and comments were extracted and categorized by resource or topic. These comments were reviewed by the WRNF Interdisciplinary Team (ID Team) during and subsequent to the post-scoping ID Team meeting in August 2013. The ID Team used comment disposition codes to identify issues and to formulate potential alternatives to the Proposed Action in response to external (public and agency) and internal (WRNF) concerns. Resource issues and indicators are identified below.<sup>5</sup>

## **H. RELEVANT CHANGES TO THE PROPOSED ACTION SINCE PROJECT SCOPING**

As stated above, the project was originally scoped, internally and externally, in 2013. Since that time, several changes have occurred that are relevant to the planning process. These are disclosed below with a brief discussion on how the change has affected this DEIS and the analysis.

Modification to the Proposed Action: The Proposed Action described below differs from the WRNF's Proposed Action as identified in the Scoping Notice, dated November 21, 2013. Adjustments were made to the proposed projects in response to information gained during field visits to the Project Area. After further analysis of current and future operations, A-Basin decided to remove the zip line and snowmaking reservoir from their proposal and reduced the amount of terrain to be developed in the Beavers. Modifications to alternatives that would reduce impacts are permitted per the USDA Forest Service Handbook (FSH).<sup>6</sup> Further rationale for the dismissal of the WRNF's Scoping Proposed Action is included in Chapter 2, Section D – Alternatives Considered but Not Analyzed in Detail. All changes in the Proposed Action are reflected in all analyses within this DEIS.

## **I. ISSUES ANALYZED AND ISSUES DISMISSED**

Based on the results of Forest Service specialist review and public scoping, the Forest Service identified specific areas of concern regarding proposed projects and classified them as either “*Issues Analyzed*” or “*Issues Dismissed*.” *Issues Analyzed* may or may not warrant the generation of an alternative and will be

---

<sup>5</sup> The scoping comment disposition analysis is available in the project file.

<sup>6</sup> USDA Forest Service, 2012b

analyzed in detail in the EIS. *Issues Analyzed* in some cases can be addressed by PDC. *Issues Dismissed* do not require further analysis due to various reasons, including the application of PDC or mitigation.

Each *Issue Analyzed* or *Issue Dismissed* below represents a concern expressed by Forest Service specialists, agencies or members of the public.

## **ISSUES ANALYZED**

Each of the following issue statements includes a list of indicators, which were identified as a means of measuring or quantifying the anticipated level of impact on a particular resource. While some indicators are necessarily qualitative in nature, every effort was made to utilize indicators that are quantitative, measurable and predictable.

### **Human Environment**

#### *Recreation*

*The Proposed Action would convert hundreds of acres of popular backcountry terrain that is easily accessible from the ski area into lift-served terrain. Furthermore, lift-serving this area would alter the terrain distribution by ability level breakdown, and change skier circulation patterns throughout A-Basin's SUP area. These changes, combined with the addition of multi-season recreation opportunities (such as the canopy tour and challenge course), would change the recreational experience within the A-Basin SUP area.*

#### **Analysis Area:**

- A-Basin's SUP area

#### **Analytical Indicators:**

- Quantification (skiers/day) of existing backcountry use of the Beavers
- Quantification (acres) of backcountry terrain in the Beavers
- Narrative discussion of backcountry use of the Beavers (e.g., access, dispersion and egress)
- Quantification of existing and proposed terrain distribution (acreage) by ability level, in relation to A-Basin's skier market
- Discussion of skier circulation under existing and proposed conditions
- Discussion of multi-season recreation opportunities at A-Basin under existing and proposed conditions
- Description of A-Basin's snow safety program under existing and proposed conditions

### *Social and Economic Resources*

*In both the short- and long-term, proposed projects could directly and cumulatively affect employment, schools, use of public/social services, and workforce housing in Summit County.*

#### **Analysis Area:**

- Summit County, Colorado

#### **Analytical Indicators:**

- Current and potential direct employment related to A-Basin's operations
- Quantification of employee/workforce housing available to A-Basin's employees
- Existing and potential demand for public services as a result of A-Basin's operations

### *Ski Area Access and Public Safety*

*Implementation of proposed projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic on Highway 6 and parking at A-Basin.*

#### **Analysis Area:**

- Highway 6 between the Town of Dillon and Loveland Pass

#### **Analytical Indicators:**

- Estimated baseline and future traffic contributions to Highway 6 as related to A-Basin's operations, during summer and winter months
- Quantification of parking capacities, and demands, at A-Basin, during summer and winter months
- Estimated number of people hitchhiking along Highway 6 after descending from the Beavers
- Narrative discussion of access to and safety issues in the Beavers

### *Scenery*

*The Scenic Integrity Objective (SIO) of the A-Basin SUP area could be impacted through construction of the Beavers chairlift, trails, tree skiing areas, and cable-based multi-season recreation activities.*

#### **Analysis Area:**

- A-Basin's SUP area and Highway 6

#### **Analytical Indicators:**

- Discussion of the existing scenic integrity of the A-Basin SUP area and potential changes to this condition
- Discussion of the SIO for the A-Basin SUP, as defined by the 2002 Forest Plan
- Compliance with Forest Plan standards and guidelines for scenery management within the SUP area and from established viewpoints (analyzed through visual simulations) by meeting the SIO

- Compliance with the intent of the Forest Service's *Built Environmental Image Guide* (BEIG) for all proposed structures. Structures should meet Forest Plan scenery guidelines for materials, colors and reflectivity.
- Compliance with Forest Service Manual (FSM) 2343.14(1) scenery criteria.

### *Cultural Resources*

***Proposed ground disturbing activities have potential to affect known or unidentified cultural resources in the Analysis Area.***

#### **Analysis Area:**

- Area of Potential Effect (APE)

#### **Analytical Indicators:**

- Summary of cultural surveys that have been completed throughout the area of potential effects and potential impacts

### **Physical and Biological Environment**

#### *Vegetation and Botany*

***Issue #1: Ground disturbance associated with construction of proposed projects could affect plant communities throughout the Analysis Area, including Threatened, Endangered, and Sensitive (TES) species, WRNF Species with an Identified Viability Concern (SIVC), Species of Local Concern (SOLC), and invasive plant species.***

***Issue #2: The majority of overstory vegetation associated with proposed ski terrain construction in the Beavers is Engelmann spruce and subalpine fir. Spruce bark beetle population buildup is a concern if spruce trees are cut and scattered in the understory of the forest canopy.***

#### **Analysis Area:**

- Areas proposed for disturbance throughout A-Basin's SUP area

#### **Analytical Indicators:**

- Identification of TES plant habitat/individuals in the Analysis Area
- Identification of WRNF SIVC and SOLC habitat/individuals in the Analysis Area
- Existing vegetation composition and area (acreage) of proposed ground disturbance and overstory vegetation removal by species/vegetation type
- Identification of BMPs to prevent any spruce bark beetle population buildup, thereby protecting the surrounding spruce/fir landscape, maintaining scenic integrity of live vegetation, and not contributing to potential future higher ground fuel loading

### *Wildlife and Aquatic Resources*

***Issue #1: Terrestrial TES, Management Indicator Species (MIS), and migratory birds could be affected by proposed ground disturbance, vegetation removal and increases in use associated with the Beavers projects and multi-season recreation activities.***

***Issue #2: Increased annual visitation resulting from implementation of the Proposed Action would lead to more vehicles on Highway 6, which could impair Canada lynx movement.***

#### **Analysis Area(s):**

- Wildlife – A-Basin’s SUP area, surrounding NFS lands, and associated lynx analysis unit (LAU) and Lynx linkage areas
- Aquatic Species – North Fork and main stem of the Snake River, adjacent NFS lands, and downstream effects to big-river fish

#### **Analytical Indicators:**

- Quantification (acres) and qualification of existing TES and MIS wildlife habitat and proposed alteration, fragmentation, or removal of wildlife habitat, by species. Include specifically lynx diurnal security habitat, winter forage habitat, and denning habitat
- Identification of impacts to avian wildlife, in particular to the construction and maintenance of the multi-season recreation activities
- Quantification and analysis of TES and MIS aquatic habitat and species (including fish, amphibians, and macroinvertebrates) in the Analysis Area
- Quantification of acreage compacted in the water influence zone (WIZ)
- Quantification of riparian vegetation disturbed and/or removed
- Quantification of individuals/populations of boreal toads impacted
- Quantification of impacts to water and downstream populations of big river fish

### *Soils*

***Ground disturbance associated with construction of proposed projects has potential to increase erosion and soil compaction, and lower soil productivity through soil organic matter and mineral losses in the Analysis Area.***

#### **Analysis Area:**

- Areas proposed for ground disturbance throughout A-Basin’s SUP area

#### **Analytical Indicators:**

- Discussion of soil conditions and baseline inventory
- Identification and quantification (acres) of temporary and permanent ground disturbance

- Analysis of erosion susceptibility based on K-factor ratings and mitigation opportunities based on identification of existing bare ground areas within the SUP in need of rehabilitation
- Digitization of bare ground/low vegetation cover areas within SUP area
- Discussion of soil stability and mass movement potential

### *Water Resources*

***Implementation of terrain modifications associated with proposed projects (particularly vegetation removal and grading) has the potential to affect stream and riparian health.***

#### **Analysis Area:**

- A-Basin's SUP area, the North Fork, and the Snake River

#### **Analytical Indicators:**

- Anticipated changes in water yield (acre feet) and peak flows (cfs), and subsequent watershed effects
- Discussion of the effects to stream health within the context of the following stream health metrics: bank stability, fine sediment, residual pool depth, wood frequency, and macroinvertebrates
- Quantification of extent of temporary and permanent impacts to the WIZ (acres) and discussion of how this affects stream health
- Quantification of changes in connected disturbed area (CDA, acres and linear feet) and discussion of how this affects stream health
- Quantification and discussion of existing drainage concerns and treatment areas, including areas of rilling and gullying
- Development and analysis of drainage management measures to maintain or improve stream health, and to prevent erosion and mass movement
- Evaluation of compliance with Watershed Conservation Practices Handbook (WCPH) and Forest Plan requirements

### *Wetlands*

***Proposed ground disturbance and overstory vegetation removal has potential to affect wetland function and values within the Analysis Area.***

#### **Analysis Area:**

- A-Basin's SUP area, the North Fork, and the Snake River

**Analytical Indicators:**

- Identification of wetlands across the Analysis Area in relation to proposed projects
- Description of compliance with Executive Order (EO) 11990, Protection of Wetlands
- Narrative description of potential effects to wetland functions and values related to proposed ground disturbance and overstory vegetation removal
- Identification of ways to avoid, minimize, and mitigate impacts to wetlands

**RESOURCE CONCERNS DISMISSED FROM FURTHER DOCUMENTATION  
IN THIS DEIS****Air Quality**

Air quality impacts are not considered a resource concern that warrants detailed analysis in this DEIS due to the scale of the proposed projects and anticipated changes to energy use and traffic levels. Activities that have the potential to impact air quality include, but are limited to, fugitive dust related to construction activities, short-term construction-related emissions, increased vehicle traffic, increased electricity use, and burning piles of removed vegetation.

The only geographically proximate Class I airsheds, or an area of particular esthetic quality, are the Eagle's Nest Wilderness area (approximately 15 miles to the west) and Rocky Mountain National Park (approximately 40 miles to the north). No specific air quality related standards or guidelines have been promulgated for the 8.25 Management Area; however, forest-wide standards require that activities "[c]omply with local, state, and federal air quality regulations and maintain conformity with the State Implementation Plan."<sup>7</sup> Average wind direction as measured at A-Basin is predominately from the west and it is unlikely that particulates or emissions generated directly or indirectly by A-Basin's operations currently affect the Eagle's Nest or Rocky Mountain National Park Class I areas.<sup>8</sup>

The extent, duration and impacts of construction (e.g., diesel equipment and dust from construction related disturbances), can be addressed through BMPs and PDC. The projected increase in electricity use and traffic due to the proposed projects is not anticipated to increase meaningfully and will not have a measureable impact on regional air quality (refer to Chapter 3, Section C – Ski Area Access and Public Safety for a discussion of potential impacts to traffic). A PDC is included in Table 2-2 regarding guidelines for burning vegetation removed during construction. Therefore, air quality impacts are anticipated to be discountable and detailed analysis is not necessary.

---

<sup>7</sup> USDA Forest Service, 2002a

<sup>8</sup> USDA Forest Service, 1999a

## **Climate Change**

Greenhouse gas (GHG) emissions were considered in proportion to the nature and scope of the Proposed Action including the potential to either affect, or be affected by, climate change. There would be increases in GHG emissions associated with additional vehicular trip generation, project construction, and grooming. However, due to the limited size and scope of the project, the effects of the Proposed Action cannot be meaningfully evaluated under current science, modeling, and policies. Therefore, it is not possible to discern significant effects on climate change as a result of implementing the Proposed Action.

Current guidance for addressing climate change in NEPA documents is provided below.

### ***Washington Office and Council on Environmental Quality Guidance on Addressing Climate Change in NEPA***

In January 2009 the Forest Service's Washington Office released a document titled *Climate Change Considerations in Project Level NEPA Analysis*.<sup>9</sup> This document provides Forest Service guidance on how to consider climate change in project-level NEPA analysis and documentation, and it was therefore considered in relation to this DEIS. Additionally, in December 2014 the CEQ released its Revised Draft *Guidance For Greenhouse Gas Emissions and Climate Change Impacts*.<sup>10</sup> The guidance provides all federal agencies with an approach for describing the effects of GHG emissions from, and the impacts of climate change on, their proposed actions. This draft guidance updates earlier draft guidance on consideration of climate change in NEPA reviews that was released by CEQ in 2010.

The 2009 Washington Office document acknowledges that "some proposals will not have cause-effect relationships to GHG or the carbon cycle, or are at such minor scale that direct effects would be meaningless to a reasoned choice among alternatives." Per the 2009 Washington Office guidance, "an analysis of GHG emissions and carbon cycles is not always appropriate for every NEPA document. As with any environmental impact, GHG emissions and carbon cycling should be considered in proportion to the nature and scope of the federal action in question and its potential to either affect emissions or be affected by climate change impacts." This is reaffirmed by the 2014 CEQ Revised Draft guidance, which states: "... Scoping a proposed action can help an agency determine whether climate change considerations warrant emphasis and detailed analysis and disclosure, and provide a basis for an agency determination that a detailed consideration of emissions is or is not appropriate for a proposed action."

The 2014 Revised Draft CEQ guidance:

- Encourages agencies to draw from their experience and expertise to determine the appropriate level (broad, programmatic or project- or site-specific) and type (quantitative or qualitative) of analysis required to comply with NEPA.

---

<sup>9</sup> USDA Forest Service, 2009

<sup>10</sup> CEQ, 2014

- Focuses analysis on the projects and actions with the greatest impacts by providing a reference point of 25,000 metric tons of CO<sub>2</sub>-equivalent emissions on an annual basis below which a quantitative analysis of GHG emissions is not recommended unless it is easily accomplished.<sup>11</sup>
- Counsels agencies to use the information developed during the NEPA review to consider alternatives that are more resilient to the effects of a changing climate; and
- Advises agencies to use existing information and science when assessing proposed actions, and highlights tools and methodologies that are available to them for conducting their analyses.

Inherent in NEPA and the CEQ Regulations is a rule of reason which ensures that agencies are afforded the discretion, based on their expertise and experience, to determine whether and to what extent to prepare an analysis based on the availability of information, the usefulness of that information to the decision-making process and the public, and the extent of the anticipated environmental consequences. Relevant CEQ and Washington Office guidance was considered in relation to this DEIS. A single comment related to climate change (from the Environmental Protection Agency [EPA]) was received during project scoping. Although the Proposed Action can be expected to result in some additional guest and construction-related traffic, minimal annual CO<sub>2</sub>-equivalent emissions from electricity use, limited loss of carbon sequestration capacity due to vegetation removal, and minimal emissions from mountain operations, based on emissions modeling from other ski area projects, the Proposed Action is not reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO<sub>2</sub>-equivalent GHG emissions on an annual basis. Therefore, an assessment of GHG emissions has not been performed for this DEIS.

## **Noise**

Due to the scope and nature of the Proposed Action and the SUP area, and the absence of nearby noise receptors, it was determined that a detailed analysis of noise was not necessary for this DEIS. The Town of Montezuma is the closest receptor, approximately 5 air miles from the A-Basin base area, and is separated from the Project Area by a ridgeline. Even considering these factors, sources of noise pollution could include increased vehicular traffic, construction of proposed projects or avalanche control work. Vehicular traffic is not anticipated to increase significantly enough to impact noise. Construction of the proposed projects would be for a limited time and is not anticipated to result in increased noise pollution. Avalanche control work would also be limited in scope, and due to the aspect and rural nature of the area, would not cause impacts to the region. In addition, based on findings in the A-Basin 2006 Improvement Plan FEIS, the average observed ambient noise level recorded in the Town of Montezuma during the hour-long avalanche control test conducted in Montezuma Bowl (approximately 3 miles distance) was 44

---

<sup>11</sup> Per the Revised Draft CEQ Guidance, when using this reference point, agencies should keep in mind that the reference point is for purposes of disclosure and not a substitute for an agency's determination of significance under NEPA. The ultimate determination of significance remains subject to agency practice for the consideration of context and intensity, as set forth in the CEQ Regulations.

dBA, which was statistically the same as ambient conditions within the level of uncertainty of readings for the Type II noise meter.<sup>12</sup>

### **Roadless Areas**

The 2012 Colorado Roadless Rule eliminated the roadless designation for 8,300 acres inside ski area SUP boundaries or lands allocated in forest plans to ski area development across the state. As a result, the roadless designation for 988 acres inside the A-Basin SUP was eliminated, and there is no overlap between the SUP area and the Porcupine Peak Colorado Roadless Area (CRA). Therefore, the proposed projects would not impact the Porcupine Peak CRA and a detailed analysis in this DEIS is not necessary.

### **Environmental Justice**

In 1994 President Clinton issued EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” to ensure such populations are not subject to disproportionately high levels of environmental risk.<sup>13</sup> EO 12898 provides that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” EO 12898 makes it clear that its provisions apply fully to programs involving Native Americans.

The 2012 census data was reviewed for Summit County. Racial diversity in the community is approximately 83 percent white and 14 percent Hispanic or Latino. Other races contribute approximately 3 percent or less are American Indian and Alaska Native, Black or African American, Native Hawaiian and Other Pacific Islander, and Asian. No disproportionately high or adverse human health or environmental effects on minority and low-income populations from the proposed projects are anticipated.

## **J. SCOPE OF THE ANALYSIS**

Scope consists of the range of actions, alternatives, and impacts to be considered within this DEIS. Furthermore, it includes the spatial and temporal boundaries associated with the actions, alternatives, and impacts as the scope of the analysis relates to the Purpose and Need. Individual project elements are discussed in detail in Chapter 2 and illustrated in Figure 2. A detailed scope of this environmental analysis is presented at the beginning of each resource section in Chapter 3. The Analysis Area is determined by individual resource analyses presented in Chapter 3 (e.g., the Water Resources Analysis Area is spatially different from the Wildlife Analysis Area). Contingent upon approval, construction of proposed projects could begin as early as 2017. It is important to note, that implementation of the projects could occur jointly, individually, and/or at different points in time.

---

<sup>12</sup> USDA Forest Service, 2006

<sup>13</sup> 59 Federal Register 7629, 1994; *Disproportionately* is a generic term used to define the adverse effects of environmental actions that burden minority and/or low income populations at a higher rate than the general public.

The CEQ has regulations for implementing NEPA that require federal agencies to consider the following types of actions, alternatives, and impacts in an environmental document.<sup>14</sup>

## **ACTIONS**

1. *Connected Actions*: actions that are dependent on each other for their utility.
2. *Cumulative Actions*: actions which, when viewed with other proposed actions, have cumulatively significant impacts and should therefore be discussed in the same impact statement.
3. *Similar Actions*: actions which, when viewed with other reasonably foreseeable or proposed actions, have similarities that provide a basis for evaluating their environmental consequences together.

## **ALTERNATIVES**

1. No Action.
2. The Proposed Action.

## **IMPACTS**

1. Direct impacts are caused by the action and occur at the same time and place.
2. Indirect impacts are later in time or farther removed in distance but are still reasonably foreseeable (i.e., likely to occur within the life of the project).
3. Cumulative impacts are the result of the incremental effects of any action when added to other past, present, and reasonably foreseeable future actions and can result from individually minor, but collectively significant actions taking place over an extended period of time.

## **K. CONSISTENCY WITH FOREST SERVICE POLICY**

### **WRNF LAND AND RESOURCE MANAGEMENT PLAN**

A-Basin's operations carried out on NFS lands must comply with management direction provided in the 2002 Forest Plan. The 2002 Forest Plan includes 33 separate Management Areas for different portions of the Forest based on ecological conditions, historic development and anticipated future conditions. All components of the Proposed Action (Alternative 2) fall within the 8.25 Management Area – Ski Areas (Existing and Potential), which directs:

*“Facilities may be intensively used throughout the year to satisfy a variety of seasonal recreational demands...Protection of scenic values is emphasized through application of basic landscape aesthetics and design principles, integrated with forest management and development objectives...Transportation systems provide convenient access to National*

---

<sup>14</sup> 40 CFR 1508.25

*Forest System lands in key portal locations with adequate public parking, base facilities, and community infrastructure. Base areas that serve as entrance portals are designed as gateways to public lands. They are architecturally designed to blend with the forest setting and contain convenient facilities and services that provide for the needs of forest visitors.”<sup>15</sup>*

As part of this analysis, the alternatives and Purpose and Need were reviewed to determine consistency with the forest-wide goals and objectives, as well as the specific standards and guidelines for Management Area 8.25. The action alternatives were compared against pertinent forest-wide and Management Area standards and guidelines. The standards and guidelines are analyzed in Chapter 3.

The Purpose and Need is consistent with the 2002 Forest Plan General Recreation Standards and Guidelines. The 2002 Forest Plan acknowledges an increasing demand for recreation on the WRNF, and states:

*“Satisfy demand for recreation services that are supplied by private-sector permittees at authorized sites or areas before new sites or areas are permitted.”<sup>16</sup>*

The theme of Management Area 8.25 is discussed in the 2002 Forest Plan and states:

*“Ski areas are developed and operated by the private sector to provide opportunities for intensively managed outdoor recreation activities during all seasons of the year. This management area also includes areas with potential for future development.”<sup>17</sup>*

The 2002 Forest Plan EIS addresses the expansion of A-Basin’s SUP area to include the Beavers:

*“Alternative K allocates 24,928 acres to the 8.25 management prescription, an 18 percent decrease from the 1984 Forest Plan. Arapahoe Basin is expanded to include Montezuma Bowl and the Beavers. Both of these expansion areas were previously included within the ski area boundary. The majority of terrain is above treeline. Skiers and boarders will benefit from increased protection from avalanches, if these areas are included within the ski area boundary and developed for skiing.”<sup>18</sup>*

## **2011 SKI AREA RECREATIONAL OPPORTUNITY ENHANCEMENT ACT**

Most of the 122 ski areas operating on NFS lands in the U.S. are authorized under special use permits per the National Forest Ski Area Permit Act of 1986 (the 1986 Act).<sup>19</sup> As originally enacted, the 1986 Act authorized Nordic and alpine skiing at ski areas on NFS lands. In November 2011 Congress enacted

---

<sup>15</sup> USDA Forest Service, 2002a

<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

<sup>18</sup> USDA Forest Service, 2002b

<sup>19</sup> 16 USC 497

SAROE, which amended the 1986 Act to clarify the authority of the Secretary of Agriculture regarding additional recreational uses of NFS lands subject to ski area permits, and for other purposes.

The purpose of SAROE was to amend the 1986 Act in two ways:

1. To enable snow-sports (other than Nordic and alpine skiing) to be permitted on NFS lands subject to ski area permits issued by the Secretary of Agriculture under section 3 of the National Forest Ski Area Permit Act of 1986; and
2. To clarify the authority of the Secretary of Agriculture to permit appropriate additional seasonal or year-round recreational activities and facilities on NFS lands subject to ski area permits issued by the Secretary of Agriculture under section 3 of the National Forest Ski Area Permit Act of 1986.

SAROE amended the 1986 Act by *striking* specific references to “Nordic and alpine” ski areas, facilities, operations and purposes and *inserting* more general language regarding “ski areas and associated facilities” and “skiing and other snow sports and recreational uses authorized by this Act.” However, for the purposes of this analysis, the most important amendment to the 1986 Act is an insertion to section 3 regarding “Other Recreational Uses.”

Per SAROE, subject to the terms of a ski area permit, the Secretary may authorize a ski area permittee to provide such other seasonal or year-round natural resource-based recreational activities and associated facilities (in addition to skiing and other snow-sports) on NFS lands subject to a ski area permit as the Secretary determines to be appropriate.

Importantly, each activity and facility authorized by the Secretary shall:

- Encourage outdoor recreation and enjoyment of nature;
- To the extent practicable:
  - Harmonize with the natural environment of the NFS lands on which the activity or facility is located; and
  - Be located within the developed portions of the ski area;
- Be subject to such terms and conditions as the Secretary determines to be appropriate; and
- Be authorized in accordance with:
  - The applicable land and resource management plan; and
  - Applicable laws (including regulations).

Inclusions identified in SAROEa:

Activities and facilities that may, in appropriate circumstances, be authorized include:

- Zip lines;
- Mountain bike terrain parks and trails;
- Frisbee golf courses; and
- Ropes courses.

Exclusions identified in SAROEa:

Activities and facilities that are prohibited include:

- Tennis courts;
- Water slides and water parks;
- Swimming pools;
- Golf courses; and
- Amusement parks.

The Secretary may not authorize any activity or facility if the Secretary determines that the authorization would result in the primary recreational purpose of the ski area permit to be a purpose other than skiing and other snow-sports.

**FOREST SERVICE MANUAL 2343.14**

On April 17, 2014, the Forest Service released its Final Directives for Additional Seasonal and Year-Round Recreation Activities at Ski Areas. FSM 2343.14 includes this final direction and criteria to help authorized officers determine whether proposals for these activities are consistent with SAROEa. FSM 2343.14(1) includes criteria for evaluating additional seasonal and year-round recreation activities and associated facilities that may be authorized at ski areas. These activities and associated facilities must:

- Not change the primary purpose of the ski area to other than snow sports;
- Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities;
- To the extent practicable, be located within the portions of the ski area that are developed or that will be developed pursuant to the master development plan;
- Not exceed the level of development for snow sports and be consistent with the zoning established in the applicable master development plan;
- To the extent practicable, harmonize with the natural environment of the site where they would be located by:

- Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape; and
- Not requiring significant modifications to topography to facilitate construction or operations;
- Not compromise snow sports operations or functions; and
- Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and chairlifts.

FSM 2343.14(2) identifies seasonal or year-round recreation activities and associated facilities that may meet these criteria. FSM 2343.14(3) identifies seasonal or year-round recreation activities and associated facilities that may not be authorized. Additional seasonal and year-round recreation activities and associated facilities that are not specifically precluded in FSM 2343.14(3) will be evaluated case-by-case based on applicable regulations and directives. Appendix C analyzes the consistency of project elements with criteria outlined in FSM 2343.14 regarding the appropriateness of the multi-season recreation activities at A-Basin.

## **L. DECISION TO BE MADE**

Based on Forest Service and external public scoping, and evaluation of the context and intensity factors contained in 36 CFR 1508.27, the Forest Service determined that an EIS would be necessary to review, analyze, and document the potential impacts to the human and biological environment anticipated to result from the implementation of the proposed projects. This DEIS is a disclosure rather than a decision document and its purpose is to provide sufficient environmental analysis to support a ROD.

Based on the analysis documented within this DEIS and a future FEIS, the Responsible Official, the Forest Supervisor for the WRNF, will decide whether to select Alternative 2 (Proposed Action) or the No Action Alternative. The Forest Supervisor is not required to choose either the Proposed Action or the No Action Alternative described herein, but may select components of the Proposed Action. In addition to determining which alternative to select, the Forest Supervisor will also determine any required PDC and BMPs. The Forest Supervisor may also require additional PDC and/or BMPs not discussed within this document. The Forest Supervisor may also require monitoring of PDC. The Forest Supervisor will also make a decision whether to amend the Forest Plan.

In compliance with FSH 1909.15 Chapter 18, the Forest Service will continually review the relevancy of the analysis and subsequent decision for new and changed conditions as any approved projects are advanced for implementation.

## **M. OTHER NECESSARY PERMITS, LICENSES, ENTITLEMENTS AND/OR CONSULTATION<sup>20</sup>**

**The Forest Service decision would apply only to NFS lands analyzed within this DEIS and would not apply to private property inholdings within SUP area.** However, other federal, state, and local entities may also have jurisdiction. Decisions by jurisdictions to issue or not issue approvals related to this proposal may be aided by the analyses presented in this DEIS. While the Forest Service assumes no responsibility for enforcing laws, regulations, or policies under the jurisdiction of other governmental agencies, Forest Service regulations require permittees to abide by applicable laws and conditions imposed by other jurisdictions. In addition to requisite Forest Service approvals, consultation with the following entities, or permits, may be required to implement any approved projects:

- U.S. Fish and Wildlife Service (USFWS), Endangered Species Act (ESA) Section 7 Consultation
- U.S. Army Corps of Engineers (USACE), Clean Water Act (CWA) Section 404
- State of Colorado, Stormwater Management Plan
- Summit County Construction Permit
- Summit County Burn Permit

---

<sup>20</sup> Per 40 CFR 1502.25(b)

# **Chapter 2**

## **Description of Alternatives**

---

## **2. DESCRIPTION OF ALTERNATIVES**

### **A. INTRODUCTION**

Chapter 2 describes the alternatives considered within this environmental analysis and briefly summarizes the environmental consequences anticipated to result with the implementation of each. As required by the CEQ, the alternatives considered are presented in comparative form.<sup>21</sup> PDC and BMPs, designed to lessen or avoid impacts anticipated to occur as a result of implementation of any of the action alternatives, are also detailed.

NEPA requires that an environmental analysis examine a range of alternatives, which are reasonably related to the purpose of the project.<sup>22</sup> Both CEQ Regulations and FSH direction emphasize that alternatives must meet the “reasonableness” criteria in order to warrant detailed analysis. Alternatives that were considered within the analysis process, but were determined not reasonable, were eliminated from detailed study with a brief discussion of the rationale for their elimination.<sup>23</sup>

The issues raised during the scoping process (detailed in Chapter 1) were utilized as the basis for determining the need for alternatives to the Proposed Action.

### **B. ALTERNATIVES CONSIDERED IN DETAIL**

In addition to the Proposed Action the required No Action Alternative is analyzed in detail within this DEIS.

Subsequent to scoping, the Proposed Action was modified in relation to issues raised internally by the WRNF and externally by the public during the scoping process. Specifically, the amount of tree removal for skiing terrain in the Beavers has been reduced. See Section D of this chapter for more information.

#### **ALTERNATIVE 1 – NO ACTION**

As required by NEPA, a No Action Alternative has been included in this analysis for review alongside the Proposed Action.<sup>24</sup> By definition, the No Action Alternative represents a continuation of existing management practices without changes, additions, or upgrades to existing conditions as a result of this NEPA analysis.

The No Action Alternative provides a baseline for comparing the effects of the Proposed Action. No new facilities or recreational opportunities would be approved under the No Action Alternative. Brief descriptions of existing on-mountain facilities, operations and opportunities, relative to the Proposed

---

<sup>21</sup> 40 CFR 1502.14

<sup>22</sup> FSH 1909.15, Chapter 10, Section 12.33

<sup>23</sup> 40 CFR 1502.14(a)

<sup>24</sup> 40 CFR 1502.14(d)

Action, are provided below. Projects at A-Basin that have been previously-approved, but not yet implemented are analyzed in the Cumulative Effects sections of Chapter 3 and are detailed in Appendix A. The No Action Alternative is depicted in Figure 1.

### **Terrain**

The existing developed trail network at A-Basin accounts for a total of approximately 958 acres of skiable terrain and accommodates the entire range of skier ability levels from beginner to expert. A-Basin's terrain is comprised of 676 acres of lift-served skiing and approximately 282 acres of hike-to/hike-back terrain accessible from the Pallavicini, Lenawee Mountain (the East Wall), and Zuma chairlifts.

The existing terrain network suffers from two skier circulation issues. First, access to Montezuma Bowl from the Lenawee Mountain and Norway chairlifts currently requires skiers to navigate a 400-foot long catwalk, which travels slightly uphill. While some skiers are able to "skate" along the catwalk, most guests (both skiers and snowboarders) choose to either stay in their gear and shuffle their way to the other end of the catwalk or remove their gear and walk. Moving along the catwalk is especially difficult in fresh snow or on windy days.

Second, due to its slope, the ridge above the top terminal of the Pallavicini chairlift is difficult for skiers to navigate. Currently, seasonal construction of a "snow road" (with snowcats) in this area minimizes cross-slopes and allows for easier travel by skiers along the ridge who want to descend the terrain to the east. Construction of this "snow road" is operationally challenging given the slope of the area.

### **Chairlifts**

There would be no changes to A-Basin's chairlift network as a result of approval of the No Action Alternative. A-Basin currently operates one high speed quad chairlift (Black Mountain Express), one quad fixed-grip (Zuma), one triple chairlift (Lenawee Mountain), three double chairlifts (Pallavicini, Norway, and Molly Hogan), and two conveyor lifts.

The Pallavicini and Molly Hogan chairlifts were both installed in 1978 and are now over thirty-five years old. While these two chairlifts are in logical alignments and service their associated terrain well, they are reaching the end of their operational lifetimes and are in need of replacement.

The Norway chairlift was also installed in 1978. In addition to being antiquated, the Norway chairlift provides redundant service to the Lenawee Mountain chairlift, which was installed in 2001 and provides critical chairlift service to the summit area and Montezuma Bowl. Because of Norway's age and redundancy, it is only operated during peak weekends and holidays, and has become obsolete.

## **Backcountry Access**

Currently there are five backcountry access points leaving A-Basin's operational boundary. There are three backcountry access points along A-Basin's operational boundary into the Beavers and Steep Gullies areas:

- Along the skier's left edge of *Cornice Run*;
- Adjacent to the Pallavicini top terminal; and
- Along the skier's left edge of Pali Cornice.

The Beavers and Steep Gullies are both within A-Basin's SUP area, outside A-Basin's operational boundary, and currently utilized by the public as "backcountry" terrain. Monitoring of backcountry skier use in these areas was conducted in 2012, 2013, and 2014, indicating that annual backcountry usage varied between approximately 2,300 and 16,600 skiers.<sup>25</sup> Backcountry use is highly dependent on snowpack and conditions. Under the No Action Alternative, the Beavers would remain an undeveloped portion of A-Basin's SUP area and would continue to be accessible for backcountry skiing via the established access points. Upon their descent, backcountry skiers would exit the terrain on Highway 6 and hitchhike back to the ski area. The area is not patrolled and no avalanche control work is performed.

Under the No Action Alternative, backcountry skiing would continue to occur in these areas as early or as late in the season as conditions allow, and is highly variable based on snow conditions. In general, backcountry use tapers off in May. A-Basin typically closes in June, at which time backcountry skier use of the Beavers and other adjacent backcountry areas is minimal.

There is limited backcountry use beyond the Beavers and Steep Gullies in an area known as the Rock Pile. This area is outside of A-Basin's SUP.

Two additional backcountry access points are located along A-Basin's operational boundary that accommodate access to backcountry areas outside A-Basin's SUP area:

- Uphill and east of the Zuma chairlift top terminal that allows access to Thurman's Bowl; and
- Down the drainage, below the Zuma chairlift bottom terminal, that intersects with Montezuma Road.

## **Ski Patrol**

Ski Patrol operations are currently located in the Snowsports Center at the base area, in the Snow Plume Refuge at the summit of Norway chairlift, and in the mid-mountain Black Mountain Lodge. Official snow safety activities are limited to the operational boundary; however, ski patrol cooperates with local emergency services to respond to needs in the area surrounding A-Basin's operational boundary.

---

<sup>25</sup> Thompson, 2014

### **Multi-Season Recreation**

The Argentine North Fork Trail, a 1.8-mile single track mountain biking and hiking trail, would continue to provide an opportunity for summer recreation at A-Basin. In addition, lunch is currently offered at the A-Frame base lodge Thursday through Sunday during the summer season (approximately June to September). This opportunity attracts visitors driving Highway 6 (Loveland Pass) for sightseeing, or on their way to destinations farther east or west along I-70. Finally, events are held throughout the summer on-mountain at the Black Mountain Lodge, including weddings.

### **ALTERNATIVE 2 – PROPOSED ACTION (MODIFIED)**

The Proposed Action is a modified version of the proposal included in the November 2013 scoping process. The original Proposed Action is discussed below in Section D, Alternatives and Design Components Considered but Eliminated from Detailed Analysis.

The Proposed Action would include approximately 338 acres of proposed skiing terrain accessed by a new chairlift in the Beavers, a new surface lift to improve access to Montezuma Bowl, replacement of the Pallavicini and Molly Hogan chairlifts, removal of Norway chairlift, grading at the summit of Lenawee Mountain, Pallavicini and Beavers chairlifts, a canopy tour, and a challenge course. The Proposed Action is depicted in Figure 2.

Based on detailed analysis and thorough consideration, the Forest Service has included a potential Forest Plan Amendment as a component of the Proposed Action, as described under the “Forest Plan Amendment” heading.

### **Terrain**

The Proposed Action would expand A-Basin’s operational boundary by approximately 492 acres and would result in approximately 338 additional acres of skiable terrain in the Beavers area.

Table 2-1 provides a breakdown of the approximate skiable acreage by terrain type that would be incorporated into A-Basin’s operational boundary under the Proposed Action. Note that the approximate acreage of skiable terrain is smaller than the extent of the operational boundary. The reader is directed to Figure 2 for the location of these areas. Terrain throughout the Beavers would only be used during the ski season, although summer trail maintenance would occur, as needed.

**Table 2-1:  
Alternative 2 Terrain Breakdown**

<b>Terrain Type</b>	<b>Approximate Skiable Acreage</b>
Trails B-2 and B-4	26 acres
Beaver Bowl	91 acres
Tree Skiing (Trails B-1 and B-3, Areas A, B, and C)	69 acres
Steep Gullies (hike-back terrain)	153 acres
<b>TOTAL</b>	<b>338 acres</b>

*Note:* Due to rounding, the total is less than the sum of all components.

### *Traditional Trails (B-2 and B-4)*

Two defined trails (B-2 and B-4) are planned in the Beavers, totaling approximately 26 acres of skiable terrain (composed of 13 acres of intermediate and 13 acres of advanced intermediate terrain). The upper sections of these trails would descend through the open terrain of Beaver Bowl (approximately 7 acres) where no vegetation removal would be required. The lower sections of Trails B-2 and B-4 would be traditional trails, fully cleared of vegetation. Approximately 2 acres of grading would occur along the open bowl portions of Trails B-2 and B-4. In addition, the cleared chairlift corridor of the Beavers chairlift would provide advanced intermediate level skiable terrain (approximately 2 acres), and is included in the above totals.

### *Tree Skiing Trails (B-1 and B-3)*

Trails B-1 and B-3 would result in approximately 24 acres of expert skiing terrain. The upper portions of these trails would be located in Beaver Bowl (approximately 12 acres) and would not require vegetation removal. The lower sections would be constructed as tree skiing trails, and approximately 20 to 25 percent of tree basal area would be removed from a corridor approximately 100 feet wide.

### *Beaver Bowl*

Approximately 91 acres of open bowl skiing would become lift-served in Beaver Bowl (in addition to the upper portions of Trails B-1 through B-4, described above). Although the upper portions of Trails B-1 through B-4 would descend through Beaver Bowl (rated intermediate through expert), the majority of the terrain in, and below, Beaver Bowl would remain undeveloped and rated as expert.

### *Tree Skiing (Areas A, B, and C)*

The Proposed Action would include tree skiing opportunities throughout the areas labelled as “A,” “B,” and “C” on Figure 2 resulting in approximately 45 acres of expert level skiable terrain. Fall lines have been identified in each area, and approximately 15 to 20 percent of tree basal area throughout 100-foot wide corridors associated with each fall line would be removed.<sup>26</sup> Below tree skiing area “C,” a

<sup>26</sup> Selective removal of individual trees for tree skiing throughout these areas would focus on dead and hazard trees first, followed by removal of other trees, where necessary.

catchment line would guide descending skiers back to the bottom of the Beavers chairlift (refer to Figure 2). The catchment line would be flagged and signed identifying the SUP boundary and last way back to the chairlift. The catchment line would be approximately 10 feet wide to accommodate ski patrollers towing toboggans; this path would require limited and incidental tree removal.

### *Steep Gullies and Traverses*

Approximately 153 acres of expert terrain in the Steep Gullies would be created that would require hiking back to A-Basin's chairlift network. In contrast to the Beavers where skiers could round-trip ski Beaver Bowl and associated terrain via Beavers chairlift, skiers would be required to hike out of Steep Gullies to return to the Pallavicini chairlift. Skiers could enter Steep Gullies from the ridge between the top terminals of Pallavicini and Beavers chairlifts, ski Steep Gullies, and hike out to the Pallavicini chairlift. Two egress traverses (upper and lower) and one emergency egress route, depicted on Figure 2, would guide descending skiers back to the Pallavicini chairlift. Topography in the area would prohibit skiers from returning to the bottom terminal of Beavers chairlift once they have entered Steep Gullies terrain. Refer to Figure 2 for the location of the proposed skier traverses.

The upper and lower egress traverses would be flagged to alert descending skiers to their locations and would merge with the proposed emergency egress route leading to the bottom terminal of the Pallavicini chairlift (see description of the emergency egress route, below). The upper traverse would be 3 to 5 feet wide, and would be constructed over the course of several seasons in order to establish the most appropriate, and natural, route out of the area. The lower traverse would be approximately 10 feet wide to accommodate ski patrollers towing toboggans, until it intersects the hike-back route, which would share the emergency egress route. Minimal spot grading would be required in two locations along the lower traverse and would be performed using hand tools or low-impact machinery (e.g., spider hoe). Both traverses would be constructed with limited tree removal.

### *Emergency Egress*

To accommodate evacuation of injured skiers by A-Basin ski patrol, an emergency egress route is proposed in the Beavers. As depicted on Figure 2, the emergency egress route would connect the bottom terminal of the Beavers chairlift to a hike-back route that leads to the bottom terminal of the Pallavicini chairlift. This route would be clearly marked as the edge of the operational boundary and groomed. The emergency egress route would be constructed to a width of 25 feet to accommodate snowcats. Approximately 4 acres of tree removal (conducted over-the-snow, followed by flush cutting in the summer) would be necessary to construct this route, with approximately two locations of "spot grading" (performed by hand or low-impact machinery) to remove incidental obstacles.

### *Picnic Table Decks*

Two picnic table decks would be constructed in the Beavers to provide places for skiers to rest and enjoy the scenery. The deck locations would take advantage of the high alpine views and natural windbreaks

(refer to Figure 2 for approximate locations). Each deck would be constructed of wood with concrete footers measuring approximately 12 feet by 20 feet to accommodate two to three picnic tables and chairs.

### **Chairlifts**

The Proposed Action includes one new chairlift, one new surface lift, two chairlift replacements and the removal of one chairlift.

#### ***Beavers Chairlift***

This proposed fixed-grip (three- or four-person) chairlift would serve intermediate, advanced intermediate, and expert terrain. The chairlift would gain approximately 1,500 vertical feet and would be designed with an hourly capacity of 1,800 people. Approximately 3 acres of tree clearing would be required for the chairlift corridor and the bottom terminal, and grading would be necessary at the top and bottom terminal locations (approximately 0.3 acre and 1 acre, respectively). Between the proposed top terminal location of the Beavers chairlift and the Lenawee Mountain and Zuma chairlifts, an area of approximately 0.5 acre would be graded to facilitate skier circulation. Small chairlift operator's shelters would be located at both the top and bottom terminals. The shelters would resemble the existing operator's shelter at the bottom of the Zuma chairlift.

The Beavers chairlift would not operate outside the ski season, although summer chairlift maintenance would occur. For power, a roughly 400-foot long underground spur from the Lenawee Mountain chairlift would be installed to the top terminal of Beavers chairlift. No power would be connected to the bottom terminal. A composting toilet would be in the bottom terminal operator's shelter for employee use only.

#### ***Zuma Access Surface Lift***

A surface lift (approximately 360 feet long) is proposed to be installed on the catwalk alignment to carry skiers from the Lenawee Mountain chairlift to the top terminal of the Zuma chairlift. Skiers returning to the front side from the Zuma chairlift would continue to ski, as the slope is slightly downhill in this direction. The proposed surface lift alignment would overlap the existing maintenance road, requiring less than 0.5 acre of grading to re-contour the areas surrounding the top and bottom of the surface lift. Excess material generated from re-contouring would be spread along the northern edge of the maintenance road to widen the skiable platform, further improving skier accessibility. The placement of this surface lift would not affect winter/summer vehicle movement.

Power for the surface lift would tie into the top terminal of the Lenawee Mountain chairlift. The power line would be buried in the existing access road.

A chairlift operator's shelter would be constructed at one end of the surface lift to provide shelter for employees.

### *Pallavicini and Molly Hogan Chairlift Replacements*

Pallavicini and Molly Hogan chairlifts (including operator's shelters) would be replaced in their existing alignments with chairlifts that would provide similar hourly capacities (1,200 and 1,000 people-per-hour, respectively) to the chairlifts that are in place today.

### *Norway Chairlift Removal*

The Norway chairlift (including operator's shelters) would be removed. The chairlift would be removed, rather than replaced, for two reasons: 1) its redundancy with the Lenawee Mountain chairlift; and 2) potential transition of some Lenawee Mountain/Norway skiers to the Beavers, further decreasing the utility of this chairlift. *Removal of the Norway chairlift would only occur following installation of the Beavers chairlift and replacement of the Pallavicini chairlift.*

### **Pallavicini Grading**

The ridgeline above the top terminal of the Pallavicini chairlift would be graded to facilitate the establishment of a seasonal "snow road." The area graded would be approximately 350 feet long and approximately 0.5 acre. Once the area is graded, no further ground disturbance would take place and vegetation would be allowed to reestablish.

### **Backcountry Access**

With incorporation of the Beavers into A-Basin's operational boundary, the three Forest Service-designated backcountry access points into the Beavers would be removed. A new designated backcountry access point to the Rock Pile would be added, as shown on Figure 2, to maintain backcountry access to terrain east of the SUP boundary. All other access points, including the existing backcountry access points to Thurman's Bowl and below Montezuma Bowl, would remain.

### **Ski Patrol**

Even though the Beavers is outside of A-Basin's operational boundary, and A-Basin does not currently provide snow safety or ski patrol activities in that area, the ski area has been monitoring the snowpack and snow conditions in the Beavers for multiple years. Therefore, A-Basin has an understanding of the snow safety operations that would be necessary to open this area to lift-served skiing. To accommodate the additional ski patrol and snow safety program in the Beavers, the Snow Plume Refuge (near the top of the Norway chairlift) would be expanded to provide storage facilities for toboggans and equipment at the summit of the ski area. The facility expansion would require a disturbance area of approximately 300 square feet, and no tree removal would be required.

Also, a new explosives magazine and makeup room would be necessary near the top of the Steep Gullies. The magazine (a box-shaped structure) would measure approximately 5 feet by 5 feet by 5 feet. The makeup room building would be approximately 6 feet by 10 feet with siding and color that would blend

in with the surrounding landscape. The building would have either solar panels on the roof or a small wind generator to power lighting.

### **Multi-Season Recreation Activities**

A-Basin proposes to implement a multi-season recreational activities program that includes a canopy tour and a challenge course. These activities could be operated year-round, with some seasonal closures based on weather and demand. Each of these activities would operate during daylight hours. The activities would not close existing ski trails.

Figure 2 identifies the locations of the proposed canopy tour and challenge course east of, and below, the Black Mountain Express chairlift.

#### ***Canopy Tour***

The canopy tour would begin northeast of the top terminal of the Black Mountain Express chairlift. On the canopy tour, guests would descend through thirteen towers via nine interlinked zip lines, other aerial features, and hiking paths while escorted by A-Basin guides back to the base area. The canopy tour would incorporate a mix of hiking paths, bridges and, potentially, smaller zip lines between stations, thus providing a range of experiences for users. From the top station, the tour would travel through existing skiing terrain and would roughly follow the *Chisholm* and *Wrangler* ski trails. The canopy tour would last for approximately three hours. The canopy tour would incorporate interpretive and education elements, potentially including topics such as natural resource management or environmental sciences. The canopy tour could accommodate approximately 24 people-per-hour, and 192 people-per-day.

Because individual trees in the spruce/fir forest throughout the Project Area are not large enough to serve as stations/anchors for individual zip lines, cables would be connected to specialized towers that are fitted with elevated platforms. Natural features, such as topography and vegetation, as well as proximity to access roads, trails, and chairlifts would determine the exact height of each individual zip line; however, each tower and zip line would be approximately 25 feet above the ground. Each station would have a platform approximately 12 feet by 12 feet. The stations would be constructed of wooden and/or natural-looking materials to the extent possible. Guy wires from each station would be required for structural stability. Fencing would enclose the areas where the guy wires tie into the ground. Fences would be primarily located on the uphill side of guy wires and stations and could be visible from nearby skiing terrain; however, the stations would be set against or in tree islands and the fencing would blend with the tree island background.

Construction of the towers would require selective vegetation clearing within an approximate 35-foot radius of the towers, as well as construction/access routes that are necessary to build and maintain the towers and can be used if evacuation is necessary during a tour. Most zip line segments would require corridors of vegetation removal approximately 10 feet wide through the forest canopy to ensure the safety of riders. Construction/access routes would typically coincide with the clearance zone along the canopy

tour route. This project would require approximately 2 acres of disturbance, including tree removal and grading for tower construction.

### *Challenge Course*

A skills-based challenge course is proposed east of the lower section of Black Mountain Express chairlift within a series of tree islands. The challenge course would consist of both elevated and ground-based elements/obstacles using a variety of materials including trees, utility poles and steel structures. The challenge course would contain multiple route options with varying degrees of difficulty and would be designed to accommodate all ranges of ages and skill levels. The high elements of the course would incorporate belay and safety systems using wire lines, friction devices, and climbing harnesses.

The challenge course would be designed to blend with surrounding vegetation and landscape features. In order to retain existing visual quality, elements would be constructed to harmonize with existing natural surroundings and would be located within/between existing tree islands. Each tower would require concrete foundations. The challenge course would result in approximately 0.5 acre of ground disturbance. Upon construction completion, disturbed ground would be revegetated. The challenge course would be integrated into the tree islands, with minimal tree removal.

### **Construction Practices**

No new roads would be necessary for construction of any of the proposed projects. A-Basin's existing road network provides sufficient wheeled access to the top of the mountain and nearly all project locations. Low-impact machinery (e.g., a spider hoe) can be walked down steep terrain to assist in chairlift and trail construction. Helicopters would be used for transport/installation of heavy infrastructure.

### *Trails*

Proposed tree removal for skiing terrain in the Beavers would be accomplished over-the-snow and on dry ground. No skid roads would be constructed. Vegetation removal for flat portions of the emergency egress route/hike-back route would be conducted over-the-snow with at least a 3-foot snowpack and prior to May 1, followed by flush-cutting in the summer. This practice would allow timber to be removed via snowcat via the hike-back route to avoid impacts to wetlands. Vegetation would be removed from the steep portion of the emergency egress route (below the bottom terminal of the Beavers chairlift) during the summer and would be pile burned on-site or removed via helicopter on steeper slopes.

Proposed Trails B-2 and B-4 (refer to Figure 2) would be clear cut during the summer months and the timber would be disposed of by pile burning, chipping or helicopter logging (on steeper slopes). A masticator could be used on a spider hoe. While removed vegetation would be primarily flush-cut, there could be minimal treatment of stumps (including treatment with a mastication implement or spider hoe) that would otherwise pose a safety risk to skiers. For the graded sections of Trails B-2 and B-4, earthwork would be accomplished by the spider hoe and explosives to loosen the soil to facilitate the process and to

minimize the access footprint.

Proposed tree skiing Trails B-1 and B-3, proposed tree skiing centerlines, and the tree skiing catchment line (refer to Figure 2), would be hand cut and the vegetation would be burned in smaller piles along the trails within openings cleared for skiing.

Rock blasting would be employed as necessary within the Project Area to remove rock outcroppings.

### *Chairlifts*

All chairlift projects would be accessed via existing mountain roads, where available; no new roads are proposed. Construction of the Beavers chairlift and replacement of the Pallavicini and Molly Hogan chairlifts would occur using existing on mountain access roads, a spider hoe and helicopters. A spider hoe would be used over dry ground to dig tower foundations and grade the terminal locations. Construction of the Zuma Access surface lift would occur using existing on mountain access roads.

### *Multi-Season Recreation Activities*

The location of the challenge course is easily accessible from the base area, and construction would be accomplished using existing on mountain access roads. The majority of the proposed canopy tour towers are accessible via existing on mountain access roads. Construction of certain towers would most likely be completed over-the-snow to minimize resource impacts. Materials and low-impact machinery would be transported to the tower locations on existing on mountain roads or in the 10-foot-wide clearance zone.

### **Forest Plan Amendment**

A Forest Plan Consistency Analysis was prepared, which considers the alternatives in the context of the applicability and relevance of each standard/guideline contained in the 2002 Forest Plan, as amended. A potential inconsistency has been identified between the Proposed Action and Standard ALL S1, pertaining to Canada lynx habitat connectivity. Standard ALL S1 (excluding technical footnotes) is:

*New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU [lynx analysis unit] and/or linkage area.<sup>27</sup>*

The Proposed Action includes removal of overstory vegetation, installation of infrastructure and, ultimately, increased human use of the Beavers throughout the winter and into the spring, when the lynx breeding season begins. Combined with additional traffic generation on Highway 6 (resulting from A-Basin's increased capacity and the improved recreational opportunities offered there), this project may not maintain habitat connectivity within the Snake River LAU and the Loveland Lynx Linkage. Therefore, a Forest Plan Amendment may be necessary if the Forest Supervisor identifies the Proposed Action as the Selected Alternative in a future ROD. Ultimately, the determination of consistency with Standard ALL S1

---

<sup>27</sup> Standard ALL S1 is contained in the Southern Rockies Lynx Management Direction ROD, which amended the 2002 Forest Plan for lynx direction.

and the need for a Forest Plan Amendment would be made in the ROD once the entire analysis is complete and public input is considered.

Detailed analysis regarding the potential Forest Plan Amendment is provided in Chapter 3, Section G – Wildlife and Aquatic Resources and Appendix B of this DEIS.

## **C. PROJECT DESIGN CRITERIA INCORPORATED INTO ALTERNATIVE 2**

In order to minimize potential resource impacts from construction and implementation of any approved projects, PDC have been incorporated into Alternative 2 (Table 2-2).

PDC are devised in the pre-analysis and analysis phases to reduce environmental impacts and comply with applicable laws and regulations. They include, but are not limited to, BMPs, standards and guidelines, and standard operating procedures.

PDC were designed by the Forest Service and specialists involved in this analysis. The potential effects of implementing Alternative 2 (provided in Chapter 3) were analyzed with these PDC applied.

PDC come from federal, state, and local laws, regulations and policies; forest plans, scientific research and from experience in designing similar projects. The majority of the PDC are considered common practices which ski area managers have historically used in alpine and sub-alpine environments to prevent or decrease potential resource impacts. They are highly effective methods that can be planned in advance and adapted to site conditions, as needed.

Responsibility for ensuring that required PDC conservation measures are implemented rests with A-Basin and the Forest Service. In all cases, the ultimate enforcement mechanism for implementation of the specified PDC and conservation measures would be the ROD for the FEIS, and would extend to the Forest Service SUP Administrator, the District Ranger, and the Forest Supervisor.

**Table 2-2:  
Project Design Criteria and Best Management Practices**

<b>RECREATION</b>
Where appropriate, fencing, flagging, signage and other safety mechanisms will be used to alert skiers to the location of canopy tour stations, guy wires, challenge course structures, and other infrastructure.
Partnerships to foster local/youth programs, programs for disabled individuals and opportunities for at-risk youth are encouraged.
<b>SCENERY</b>
Prior to development of above ground structures, facilities, features, including bridges, towers, chairlift structures, canopy tours, etc., design plans will be reviewed and approved by the Forest Service as part of the WRNF Design Review Process. The proposed structures must meet the BEIG guidelines. The BEIG is found at <a href="http://www.fs.fed.us/recreation/programs/beig/">http://www.fs.fed.us/recreation/programs/beig/</a> .
Choose structure design, scale, and color of materials, location, and orientation to meet the scenic integrity level of the Project Area.
Stumps must be cut as low as possible to the ground to avoid safety hazard and lessen scenery impact.
All structures, facilities, features including bridges, towers, chairlift structures, zip lines, canopy tours, and all other above ground features will meet color guidelines. Bright colors are inappropriate for the forest setting. The colors must be muted, subdued colors because they blend well with the natural color scheme. The FSH 617, "National Forest Landscape Management for Ski Areas, Volume 2, Chapter 7," refers recommended colors for ski areas.
All structures, facilities, features including bridges, towers, chairlift structures, canopy tours and all other above ground features will meet reflectivity guidelines. This includes any reflective surfaces (metal, glass, plastics, or other materials with smooth surfaces), that do not blend with the natural environment. They must be covered, painted, stained, chemically treated, etched, sandblasted, corrugated, or otherwise treated to meet the solar reflectivity standards. The specific requirements for reflectivity are as follows: Structures with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.
Trees will be retained, where possible, to provide species and size diversity, maintain forest cover, and screen facilities.
Avoid straight edges where removing trees. The edges of the tree clearing areas, where the vegetation is removed, need to use a variable density cutting (feathering) technique applied to create a more natural edge that blends into the existing vegetative, where possible. Edges will be non-linear, and changes in tree heights along the edges of openings will be gradual rather than abrupt. Soften hard edges by selective removal of trees of different ages and heights to produce irregular corridor edges where possible.
Utilities must be buried as per Forest Plan Standard.
All facilities including trails and signs must meet Forest Service Accessibility Guidelines. Forest Service Outdoor Recreation Accessibility Guidelines: <a href="http://www.fs.fed.us/recreation/programs/accessibility/">http://www.fs.fed.us/recreation/programs/accessibility/</a>
<b>CULTURAL RESOURCES</b>
Although site-specific surveys have been conducted, if undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, address as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.

**Table 2-2:  
Project Design Criteria and Best Management Practices**

<b>VEGETATION</b>
<b>Rare Plants</b>
Before implementing any approved project activities not included in the 2013 botanical survey area, the specific project areas will be surveyed using established protocols. Surveys would be conducted for Threatened, Endangered, Proposed and Candidate Species, Region 2 (R2) sensitive species, SOLC, and SIVC.
If any previously unknown occurrences of R2 Sensitive, SOLC or SIVC plants are encountered within the project footprint prior to or during project implementation, a Forest Service Botany Representative will be notified to derive suitable mitigation measures to avoid or minimize impacts as appropriate.
Minimize and avoid impacts to habitat occupied by relatively common <i>Botrychium</i> spp. (SOLC), and that provides habitat for R2 Sensitive moonworts.
Use construction fencing or other barriers to delineate occupied moonwort habitat adjacent to ground disturbance areas and direct construction personnel to avoid parking or storing materials in these areas.
<b>Forest Health and Revegetation Practices</b>
Draft and implement a Post-construction Revegetation and Rehabilitation Plan, as outlined under “Soils.”
To prevent an increase and buildup of spruce bark beetle populations, adhere to the following relating to live Engelmann spruce felled in conjunction with glading, trail construction and other improvements: <ol style="list-style-type: none"> <li>1. Where live Engelmann spruce greater than 8.0” diameter at breast height (DBH) are felled and left in place, limb entire tree to a 6.0” top diameter, peel or strip bark from bole of tree on 70% or more of the surface area of the tree.</li> <li>2. Where live Engelmann spruce greater than 8.0” DBH live are piled for burning, complete burning within one year of felling/piling trees.</li> <li>3. Where feasible, remove all live Engelmann spruce greater than 8.0” DBH from ski area SUP for processing into lumber or biomass within one year of felling.</li> </ol>
Minimize overstory vegetation removal for canopy tour towers 8 and 9, in the vicinity of the <i>Chisolm</i> and <i>Moose Hollow</i> ski trails, while maintaining skier safety and circulation.
<b>Noxious Weeds</b>
Follow the WRNF noxious weed recommended design features to avoid the spread of noxious or other undesirable weed species and to manage existing populations toward eradication or acceptable levels when eradication is not realistic.
Pretreatment of existing infestations with approved herbicides within the Project Area must be conducted prior to project implementation. Herbicide choices and application rates for treatment are available from the District/Forest Weed Program Manager.
Clean Equipment. Ensure that prior to moving onto NFS lands, all off-road equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious weed seeds. “Off-road equipment” includes all construction machinery or off highway vehicles, except for trucks, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. The project administrator will inspect the equipment prior to entrance onto the Forest to see that it is free of debris.
<b>RIPARIAN AREAS AND WETLANDS</b>
A CWA Section 404 Permit would be obtained from the USACE prior to disturbance to wetlands associated with the removal and replacement of the Norway, Molly Hogan, and Pallavicini chairlifts. The 404 Permit may require the preparation and approval of a mitigation plan for impacts wetlands or other waters of the U.S. (WOUS). This mitigation plan will also be submitted, reviewed and must be approved by the Forest hydrologist, or their representative prior to implementation.
Prior to project implementation, identify and mark the location of seeps and springs associated with wetlands and fens in the emergency egress and hike-back routes. Ensure that location markers will be visible during over snow operations. Conduct over-the-snow operations to avoid damage to seeps and springs.

**Table 2-2:  
Project Design Criteria and Best Management Practices**

Conduct tree removal in the Beavers area and along the emergency egress and hike-back routes when snow depth is 3 feet or greater and prior to May 1. Monitor over-the-snow tree skidding and adjust operations so wetland impacts are avoided.
Ensure that no impacts to wetland fens occur. More specifically, no grading, tree clearing, vegetation trimming, or access routes will be permitted in any wetland fen. Maximize distance between areas of overstory vegetation removal and delineated fen wetlands, taking into consideration topography, design limitations, and other resource impacts (e.g., grading). Vegetation removal for flat portions of the emergency egress route/hike-back route will be conducted over-the-snow with at least a 3-foot snowpack and prior to May 1. All fens adjacent to proposed project activities will be delineated and clearly marked by a qualified individual(s) prior to construction and all construction personnel will be notified to avoid impacting such areas. Any other wetland to be avoided within and/or adjacent to Project Area activities will also be delineated and flagged by a qualified individual(s) prior to construction.
To avoid and minimize impacts to riparian areas and wetlands, consider alternative timber removal/disposal methods (e.g., pile burning in areas furthest from Pallavicini chairlift). If additional burning is considered, a monitoring and rehabilitation plan will be developed to ensure protection of wetlands.
The canopy tour and challenge course project will not impact wetlands. Construction access to tower 4 of the canopy tour will not impact the adjacent wetland complex.
Flush-cut and leave stumps and root wads intact within wetlands, except in areas identified for grading activities (bottom terminal replacements for Pallavicini and Molly Hogan chairlifts).
Slash and debris will not be placed in wetlands.
Utilize BMPs to prohibit sediment migration from ground disturbances into wetlands or streams.
Avoid and minimize wetland impacts during final submittal of construction plans and in the field.
Before project implementation: clearly mark wetlands boundaries within the vicinity of any ground disturbing activities to implemented in the summer construction season and ensure that all equipment operators are aware of their presence. Keep ground vehicles out of wetlands unless protected by at least 3 feet of packed snow or where a temporary wetlands crossing is approved by the Forest. For approved temporary crossings, lay down construction mats or other physical barriers to protect against soil displacement and minimize the number of passes. Do not disrupt water supply or drainage patterns into wetlands.
Temporarily place construction spoils in upland areas in locations that will not migrate to wetland areas.
Stockpile topsoil during construction and replace in order to preserve the wetland seed bank.
Preserve and replant woody vegetation (e.g., Salix) and plant additional hydrophytic woody and herbaceous vegetation where necessary in order to speed the recovery of the wetland community.
For ongoing operations: Do not operate snowcats, snowmobiles or other machinery in wetlands unless protected by 2 feet of packed snow. Cease operations when snow cover is not adequate to protect wetland soil from disturbance.
<b>AIR QUALITY</b>
Site improvements would be installed promptly in order to reduce the potential for dust emissions. The area disturbed by clearing, earth moving, or excavation activities would be kept to a minimum at all times, allowing improvements to be implemented in sections.
Grading areas, including chairlift terminal areas, would be watered as necessary where road access is available to prevent excessive amounts of dust. In the absence of natural precipitation, watering of these areas would occur as practical.

**Table 2-2:  
Project Design Criteria and Best Management Practices**

Pile burning of cleared timber will adhere to the State of Colorado Burn Permit. Prior to burning timber, A-Basin must consult with the WRNF on size and timing of burning.
<b>SOILS</b>
<p>Prior to approved construction activities on NFS land, A-Basin will prepare the following plans for Forest Service review:</p> <ol style="list-style-type: none"> <li>1. Grading</li> <li>2. Stormwater Pollution Prevention Plan, Erosion Control, and Drainage Management</li> <li>3. Post-construction Revegetation and Rehabilitation</li> <li>4. Construction Management</li> </ol> <p>The grading, erosion control and drainage management, and post-construction revegetation and rehabilitation plans could be contained in the construction management plan. Plans must be submitted by A-Basin to the mountain sports ranger by April 1 of the intended construction season.</p>
<p>A Grading Plan will be required for all projects with major earthwork, or at the discretion of Forest Service officials.</p> <ul style="list-style-type: none"> <li>• Prepare a grading plan for sites that would require grading in excess of 2,000 square feet. Portray existing topography and cut/fill areas on large scale site plans. Define grading limits on the ground before construction by placing stakes, flagging, wattles, sediment fence, construction fence or some physical barrier along the perimeter of the area to be graded. Ensure that all grading is confined within the specified grading limits.</li> <li>• For grading projects greater than 1 acre, prepare an erosion control plan that, at minimum, meets the basic requirements for stormwater permitting through the State of Colorado Stormwater Management Program.</li> </ul>
<p>The Erosion Control and Drainage Management Plan will contain:</p> <ul style="list-style-type: none"> <li>• Silt fences, straw bales, straw wattles, and other standard erosion control BMPs to contain sediment onsite.</li> <li>• Erosion-control matting on steep fill slopes (i.e., land with a slope angle of 35% or greater) will be utilized to protect soils and enhance conditions for vegetation re-establishment. Biodegradable netting (erosion control blankets and matting) should be used; netting should be free of persistent plastic/polypropylene materials.</li> <li>• Slope movement monitoring protocols will be developed in coordination with the Forest Service soils/geology staff or their representative. These protocols will be implemented during construction and during post-construction monitoring.</li> <li>• A condition to return slash and native organic litter to site, apply imported soil organic matter, and use soil fertility to restore site organic matter and nutrients. No-net loss of soil organic matter (mineral A and/or organic O horizons) will be ensured through pre- and post-construction soil monitoring and subsequent reclamation, if necessary.</li> <li>• A condition to stockpile topsoil during construction, maintenance, and operations to the extent possible to maintain organic matter. Re-spread this material following construction and augment with Forest Service-approved soil amendment after post-construction soil organic matter transects are completed.</li> </ul>
<p>The Post-construction Revegetation and Rehabilitation Plan will contain:</p> <ul style="list-style-type: none"> <li>• Documentation/findings of soil surveys (see below) to measure soil organic matter depths within areas of disturbance.</li> <li>• A list of materials to be used for site stabilization and revegetation (i.e., soil amendments, seed mixes, erosion control blankets). Seed mixtures and mulches will be free of noxious weeds. To prevent soil erosion, non-persistent, non-native perennials or sterile perennials may be used while native perennials become established. The Forest Service must approve the seed mixtures prior to implementation, unless previously approved seed mixes are employed.</li> </ul>

**Table 2-2:  
Project Design Criteria and Best Management Practices**

<ul style="list-style-type: none"> <li>• A monitoring protocol for vegetative cover standards from the WRNF Forest Plan to be implemented for a minimum of three years following seeding. Monitoring will include the presence of invasive plants, and retreatment of invasive plants as necessary.</li> <li>• Areas determined to have been compacted by construction activities may require mechanical subsoiling or scarification to the compacted depth to reduce bulk density and restore porosity.</li> <li>• Ground cover, as a combination of revegetation, organic amendments and mulch applications, will restore depths of soil A and/or organic ground cover.</li> <li>• Reclaim disturbed areas promptly when use ends to prevent resource damage and invasion of noxious weeds. Ensure proper drainage, rip compacted areas, and apply a Forest Service-approved seed mix and organic soil amendments to facilitate revegetation.</li> </ul>
Details of timelines, contractors to perform work tasks, seed mixes, soil amendments, and necessary surveys will be provided to the mountain sports ranger no later than April 1 of the intended construction season.
Design, implementation, and monitoring roles and responsibilities will be clearly defined and included in the construction management plan, submitted by April 1 of the intended construction season.
Prior to construction, soil surveys will be completed within the disturbance area to ensure no net loss of soil organic matter. Personnel responsible for these surveys will be identified in the construction management plan checklist.
Use existing roads unless other options will produce less long-term sediment. Reconstruct for long-term soil and drainage stability.
Vegetative buffers will be maintained adjacent to intermittent or perennial drainages and wetlands, to the extent possible. Where avoidance of the vegetative buffer is not possible, disturbance will be minimized.
When logging over-the-snow (except in locations described above), conditions should allow for 1 foot of packed snow to be continuous (i.e., not patchy) and competent enough so that wheeled or tracked vehicles do not break through. When logging over frozen ground, a minimum of 3 inches of continuous frozen ground should be present.
Maintain a no net disturbance through offsets and reclamation projects.
Do not encroach fills or introduce soil into streams, swales, lakes, or wetlands. Install sediment waddles, sediment fencing, retention basins, or other applications before ground-disturbing activities begin. Favor applications that maintain functionality without maintenance, such as sediment retaining wattles. Service sediment retention applications before leaving the site and remove non-natural and non-biodegradable materials. Favor applications that use natural or biodegradable materials that can be left on-site.
<p>Biomass management strategies (chipping/mastication) should adhere to the following protocol:</p> <ul style="list-style-type: none"> <li>• Based on literature review and the best available science, wood chip depth shall not exceed a maximum depth of 3 inches (7.5 cm) and should be applied at a relatively uniform thickness. Rake by hand as necessary to achieve uniform application.</li> <li>• Incorporate needles and/or leaves into chipped biomass to balance nutrient content of wood chips and to mimic the carbon to nitrogen (C:N) ratio of the native forest floor. Ideally, the C:N of applied biomass material should be less than 30:1.</li> <li>• Avoid operations with chipping/mastication equipment during periods of excess soil moisture. Use broad, sweeping turns with equipment, as practicable, to avoid rutting and displacement of soil.</li> <li>• Monitor for invasive weeds following operations with chipping/mastication equipment, particularly Canada thistle (<i>Cirsium avense</i>).</li> </ul>

**Table 2-2:  
Project Design Criteria and Best Management Practices**

<b>WILDLIFE</b>
To minimize impacts to Canada lynx and their nocturnal movements, regular snow grooming operations within the Beavers Project Area (below treeline) should be focused outside the hours of 10 p.m. to 4 a.m. It is anticipated that A-Basin will need to conduct grooming during this period on an infrequent basis throughout the ski season. The annual winter operating plan will consider this measure on an annual basis and may be adjusted over time as knowledge of grooming practices are better understood, with the consideration of minimizing impacts to Canada lynx.
The traverse and egress lines in the Beavers and Steep Gullies will be roped and marked with signs to discourage skier use below the emergency egress route. Signs will indicate the operational boundary and will direct skiers back to the Pallavicini chairlift.
Vegetation removal for flat portions of the emergency egress route/hike-back route will be conducted over-the-snow with at least a 3-foot snowpack and prior to May 1, when toads are inactive. There is no time restriction associated with subsequent stump clearing as long as vehicles are not used.
Snowcat use of the emergency egress route should be limited to the period when toads are inactive (November 1 to May 1). Exceptions may be approved on a case-by-case basis as determined by the Forest Service aquatic biologist based on snow conditions and with consideration for toad movements.
The canopy tour operation will be limited from 9 a.m. to 4 p.m. in the summer and fall to minimize disturbance to bighorn sheep, elk and deer. Exceptions must be verified on a case-by-case basis with the WRNF.
Surveys for the denning/nesting of threatened, endangered, and sensitive species by a qualified biologist will be conducted prior to construction season if construction activities are proposed prior to July 15. Construction of approved projects shall occur, to the extent practicable, outside the active denning/nesting period or as otherwise approved by the Forest Service Responsible Official.
Surveys for active migratory birds' nests must be conducted by a qualified biologist shall be conducted prior to construction season if tree cutting activities are proposed prior to July 15. Retain trees with active nests when practicable while occupied. When possible retain snags that are providing cavity nesting habitat.
If flamulated or boreal owl nests are located within project areas, direct mortality of eggs and/or nestlings shall be avoided by conducting tree removal in nesting habitat outside of the May 21 to July 15 nesting period, or as otherwise approved by the Forest Service Responsible Official.
If olive-sided flycatcher nests are located within project areas, direct mortality of eggs and/or nestlings shall be avoided by conducting tree removal in nesting habitat outside of the June 1 to July 15 nesting period, or as otherwise approved by the Forest Service Responsible Official.
Surveys for active raptor nests/cavities shall be conducted by a qualified biologist prior to construction season if construction is to occur prior to July 31. To allow for successful nesting and young rearing, no project ground disturbing activities or tree cutting shall be allowed within 0.25 mile of active raptor nests/cavities until after July 31, or if fledging has occurred (confirmed by a qualified biologist), or as otherwise approved by the Forest Service Responsible Official.
To reduce the risk for human/wildlife conflicts in areas where food or trash could be present, all trash containers must be bear proof and any locations that have food products stored outside of a building must have bear proof food containers.
During construction of the facility, contractors are required by Summit County code to provide a bear proof container on site for all edible and food related trash in order to minimize conflicts with black bears. No food products or food containers can be thrown in the larger roll-off type dumpsters.
Any new summer use developments must adhere to the Colorado Parks and Wildlife bear safety guidelines: Be Bear Aware.
All construction activities will be confined to daylight hours, excluding emergencies.
Workers will not bring dogs on site during construction.
No food or drink will be stored in construction vehicles. All windows must be kept closed and doors locked on all vehicles to prevent bear entry.

**Table 2-2:  
Project Design Criteria and Best Management Practices**

Reduce sediment sources (CDA) on existing and proposed trails and stream crossings to prevent impact to aquatic species.
<b>WATER RESOURCES</b>
Prepare detailed site plans where summer uses would concentrate foot traffic or ground transport into high traffic areas. Design sites for proper drainage and to be resistant to erosion associated with the intended traffic. Incorporate native vegetation into site plans.
For ground-disturbing activities near perennial and intermittent streams, and ephemeral draws, minimize Connected Disturbed Area by ensuring that roads, road ditches, and other disturbed areas drain to undisturbed soils rather than directly to streams and ephemeral draws. Manipulate drainage from disturbed areas as necessary using natural topography, rolling dips, waterbars, ditch-relief culverts, etc., to disconnect disturbed areas from streams.
To disconnect connected disturbed areas, A-Basin will implement the following actions:
<ol style="list-style-type: none"> <li>At approximately 550 feet from the gate near Highway 6, the road-side ditch flows into a 24-inch culvert which discharges directly into a stream tributary to the North Fork Snake River. Disconnect the road and ditch from the stream system by implementing the following BMP for erosion and sediment control: <ul style="list-style-type: none"> <li>Properly install and maintain three rock check dams in the ditch, immediately before the culvert, and at 25 and 50 feet upstream; construct the check dams with Type L riprap (<math>D_{50} = 9''</math>).</li> </ul> </li> <li>A 240-foot long section of road-side ditch just above the second switch-back (approximately 1,370 feet from the gate) drains directly into a small tributary to North Fork Snake River. Disconnect the road and ditch from the stream system by implementing the following BMPs for erosion and sediment control: <ul style="list-style-type: none"> <li>Design, construct and maintain a sediment trap at the discharge of the road-side ditch to detain sediment before it reaches the stream. Inspect the sediment trap at least once annually; remove and properly dispose accumulated sediment as required.</li> <li>Properly install and maintain two rock check dams in the ditch, at 25 and 50 feet upstream from the sediment trap; construct the check dams with Type L riprap (<math>D_{50} = 9''</math>).</li> </ul> </li> <li>A perennial stream tributary to North Fork Snake River crosses under the mountain road through a 48-inch culvert about 2,050 feet from the gate. The adjacent road-side ditch discharges directly into the stream. Disconnect the road and ditch from the stream system by implementing the following BMPs for erosion and sediment control: <ul style="list-style-type: none"> <li>Design, construct and maintain a sediment trap at the discharge of the road-side ditch to detain sediment before it reaches the stream. Inspect the sediment trap at least once annually; remove and properly dispose accumulated sediment as required.</li> <li>Properly install and maintain two rock check dams in the ditch, at 25 and 50 feet upstream from the sediment trap; construct the check dams with Type L riprap (<math>D_{50} = 9''</math>).</li> </ul> </li> </ol>
Keep heavy equipment out of streams except to cross at locations designated by the Forest Service. Avoid in-stream work except to build approved crossings or complete restoration work. Add or remove rocks, wood, or other material in streams only if such actions maintain or improve stream health. Avoid altering the stream bed and banks and maintain the natural character of the stream.
Do not install culverts or conduct ground-disturbing activities near streams during spring runoff, or during periods of heavy precipitation.
Do not locate roads, trails, or other disturbed areas on slopes that show signs of instability, such as slope failure, mass movement, or slumps.
For projects that would increase road traffic, or require road use by heavy construction equipment, apply road surfacing near stream crossings as needed to harden the road surface in order to minimize rutting and sediment delivery to streams.
Keep all debris generated by project activities out of streams and ditches.

**Table 2-2:  
Project Design Criteria and Best Management Practices**

Prior to implementation of the grading projects proposed to be constructed within the WIZ, site visits to the project areas will be completed by Forest Service personnel or a qualified specialist. The purpose of the site visits will be to field-fit and flag areas to be graded in the vicinity of stream channels to ensure tree removal and grading in the WIZ is minimized to the extent possible.
Upon completion of these site visits, A-Basin shall prepare site-specific erosion control plans for review by a Forest Service hydrologist and/or soil scientist (or a qualified specialist). The erosion control plans shall show the proposed surface drainage slope and direction, and specify the type and location of erosion control BMPs.
To the maximum extent possible, use existing roads to access project sites.
Avoid routing canopy tour walking trails and temporary construction access paths directly down the fall line.
Reclaim temporary disturbed areas promptly to prevent resource damage and invasion of noxious weeds. Ensure proper drainage, rip compacted areas, and apply a Forest Service-approved seed mix and fertilizer to facilitate re-vegetation. Areas compacted by construction activities may require mechanical scarification to reduce bulk density and restore soil porosity.
To the extent possible, maintain vegetative buffers adjacent to perennial or intermittent stream channels and wetlands.
Soil-disturbing activities will be avoided during periods of heavy rain or excessively wet soils.
Do not store excavated materials in the WIZ.
Before construction of grading projects, clearly define grading limits on the ground by placing a physical barrier, such as wattles or construction fence, along the perimeter of the area to be graded.
Properly design, install, and maintain all BMPs for erosion and sediment control. Remove non-natural and non-biodegradable materials before leaving the site following construction.

## **D. ALTERNATIVES AND DESIGN COMPONENTS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS**

During the course of this NEPA process, numerous alternatives have been considered. In particular, initial analysis resulted in the modification of the original Proposed Action in favor of a less impactful design. These modifications were the result of ground-truthing each project component by mountain planning and environmental specialists, as well as chairlift engineers, surveyors, and mountain operations personnel. These modifications reflect how improved, up-to-date information helped create a proposal which responds well to resources present within the Project Area.

Several substantial design components were considered but eliminated from further detailed analysis prior to A-Basin's submission of their proposal to the Forest Service and the initiation of this EIS process. These planning concepts were eliminated from further review for several reasons including environmental impacts, prohibitive cost, and technical constraints. The following section presents a brief synopsis of the design and project elements considered and the rationale for their elimination.

### **ORIGINAL PROPOSED ACTION**

The *original* Proposed Action (as scoped in November 2013) has been eliminated from further analysis. This alternative included the development of approximately 472 acres of skiable terrain in the Beavers. Following scoping, the Forest Service ID Team developed an alternative to the *original* Proposed Action that would minimize impacts to Canada lynx by reducing the amount of overstory vegetation removal in the Beavers. During the analysis process it became apparent that the reduced-impact alternative (e.g., approximately 50 acres less vegetation clearing compared to the *original* Proposed Action) would not result in a substantially different recreational experience. Therefore, the *original* Proposed Action was eliminated from further analysis and the reduced-impact alternative became the Proposed Action analyzed in this DEIS.

### **ZIP LINE**

Subsequent to the scoping process, the proponent requested that the Forest Service no longer study the zip line in this NEPA process. Therefore, the Forest Service has eliminated this project element from consideration in this DEIS.

### **EXPANDING SNOWMAKING WATER STORAGE**

Subsequent to the scoping process, the proponent requested that the Forest Service no longer study expanding water storage in this NEPA process. Therefore, the Forest Service has eliminated this project element and the Purpose and Need statement related to this project from consideration in this DEIS. Additional storage capacity for snowmaking water could be considered in the future separate from this NEPA process.

## **NO CHAIRLIFT SERVICE WITH IMPROVED HIKE-OUT OF BEAVERS/STEEP GULLIES**

Under this alternative, which was initially considered by A-Basin during development of its 2012 MDP, no chairlift would be constructed in the Beavers, and vegetation removal would be minimized to only what is necessary to allow people to hike-back to the base area. By removing the majority of the proposed vegetation disturbance in the Beavers, this alternative addresses concerns related to the impact to Canada lynx habitat. A-Basin would control/patrol the Beavers and Steep Gullies, but skiers would be required to hike-back to the Pallavicini chairlift corridor or to Highway 6. An egress trail would be partially skiable, but would also require a minimal hike-out to the Pallavicini chairlift.

As previously mentioned, this alternative was considered as it minimizes vegetation removal and disturbance in the Beavers, which was identified by Forest Service specialists as a primary wildlife concern with the Proposed Action. After further consideration, this alternative was eliminated as it does not address other elements of the Purpose and Need. Although this alternative would address vegetation and wildlife issues, the remaining considerations of safety, operational difficulties, and resort/terrain expansion remain. Under this alternative, skiers and riders would be forced to hike-back to Pallavicini chairlift or hitchhike via Highway 6 back to A-Basin. Similarly, it would be more difficult for ski patrol to perform avalanche and other safety practices, and the response/evacuation time would be slow due to the required hike-out trail to Pallavicini chairlift. These factors would not address the Purpose and Need of expanding the operational boundary into the Beavers to increase safety. Without adding infrastructure to Beaver Bowl, Pallavicini chairlift would likely require an upgrade to a high-speed, detachable chairlift as it would be the main connection for skiers and riders in the Beavers and Steep Gullies. Furthermore, without the infrastructure or trail work/vegetation removal, the Beavers would largely remain expert only terrain which would not meet the Purpose and Need of providing additional high alpine, intermediate ability level terrain as indicated in Table 1-1. For these reasons, this alternative was considered but eliminated from detailed analysis.

## **VALLEY FLOOR TRANSPORTATION CHAIRLIFT WITH UPGRADED PALLAVICINI**

Under this alternative, skiers descending Beaver Bowl and Steep Gullies would be captured by a traverse/hike-back route that directs them to a transportation chairlift located on the valley floor just north of the Steep Gullies. The transportation chairlift would take skiers to the Pallavicini chairlift.

For this option it is assumed that skier use in the Beavers would be similar to the Proposed Action; however, it precludes use of the Beavers and Steep Gullies by intermediate and advanced intermediate skiers due to the lack of intermediate terrain on the lower portion of the area. This option would maintain the Steep Gullies as hike-back only with improved egress and emergency access trails.

With potentially fewer people skiing in the Beavers area due to a lack of direct lift service, this alternative was considered as it could reach consistency with Standard ALL S1 to maintain habitat connectivity. Due

to the proximity to the riparian area along the North Fork Snake River, there would be impacts to additional Canada lynx habitat, visual resources, streams, wetlands, and boreal toad habitat from the surface lift.

As this surface lift would return skiers and riders directly to Pallavicini chairlift, a substantial upgrade would be necessary to accommodate the increase in hourly capacity. This expansion would increase the demand of a variety of chairlifts (new transportation chairlift, Pallavicini, Lenawee Mountain) necessary for any round trip or lap skiers and riders. The required upgrade and chairlift additions are heavily dependent on snow and may be inoperable during early and late season conditions. These upgrades would likely be poorly received with A-Basin's loyal users as they value the rustic nature of the Pallavicini chairlift. For these operational reasons, this alternative was considered but eliminated from detailed analysis.

### **VALLEY FLOOR TO TOP OF PALLAVICINI CHAIRLIFT**

Under this alternative, a chairlift would be constructed between the valley floor below the Beavers to the ridgeline near the top of the Pallavicini chairlift.

For this alternative it is assumed skiing in the Beavers would be as described in the Proposed Action; however, this alternative precludes use of the Beavers and Steep Gullies by intermediate skiers due to the lack of intermediate terrain on the lower portion of the area. This option would maintain the Steep Gullies as hike-back only with improved egress and emergency access trails.

This alternative potentially would not be consistent with Standard ALL S1 as it would likely restrict habitat connectivity and impair functioning lynx habitat near the high quality riparian area lynx habitat. Additionally, the proximity of the bottom terminal to the riparian area would result in potential direct or indirect impacts to boreal toad habitat, streams, wetlands, and visual resources. Although this alternative would address avalanche safety/risks, placing the chairlift across the Steep Gullies is not an ideal alignment. As previously stated, without developing intermediate terrain, A-Basin would not conform to existing and future skier and rider demographics projected by WRNF. This addition would address the Purpose and Need for additional lift-served terrain but due to early and late season snow levels, this chairlift would see limited skiable days in comparison to other areas. For these reasons, this alternative was considered but eliminated from detailed analysis.

### **VALLEY FLOOR TO TOP OF NORWAY CHAIRLIFT**

This alternative would include a single chairlift extending from the valley floor to the summit (near the top terminal of the Norway chairlift). For this alternative it is assumed skiing in the Beavers would be as described in the Proposed Action; however, it precludes use of the Beavers and Steep Gullies by intermediate skiers due to the lack of intermediate terrain on the lower portion of the area. This alternative would maintain the Steep Gullies as hike-back only with improved egress and emergency access trails.

While this alternative would address the Purpose and Need for additional chairlifts and avalanche safety/risk in the Beavers, it was eliminated for a variety of reasons, including those resource concerns disclosed in the “Valley Floor to Top of Pallavicini Chairlift” alternative discussion above. Chairlift operating days may also be limited in the early and late season due to considerably less snow on the lower one-quarter of the Beavers.

### **TWO-CHAIRLIFT CONFIGURATION IN THE BEAVERS**

This alternative would include the same Beavers chairlift that is included in the Proposed Action that would lift-serve the upper three quarters of the Beavers. In addition a second, lower, chairlift is included in this option that would extend from the valley floor to the bottom terminal of the Beavers chairlift. This alternative would make the Beavers and Steep Gullies round-trip skiable, without having to hike or traverse back to Pallavicini, essentially making the Beavers a self-contained chairlift and terrain pod.

This option would address the avalanche safety/risk in the Beavers as well as provide additional lift-served and hike-to terrain to a wider demographic. Constructing two chairlifts would reduce skier densities, shorten lift lines and preserve snow quality. However, this alternative was eliminated as it may not be consistent with Standard All S1 as it would likely restrict habitat connectivity and impair functioning lynx habitat as well as impact boreal toad habitat, streams, wetlands, and scenery resources.

### **BEAVERS CHAIRLIFT WITHOUT TERRAIN IMPROVEMENTS**

This alternative includes the same chairlift alignment as included in the Proposed Action, but omits any grading, trail construction, or glading that would improve the skiing experience in the Beavers. For this option it is assumed skiing in the Steep Gullies would be hike-back only with improved egress and emergency access trails.

This option was considered as it would address avalanche safety/risk in the Beavers consistent with the WRNF Forest Plan 2002 FEIS. Without developing terrain, the Beavers would remain expert ability level terrain, thereby limiting the accessibility of the terrain. This option would have no effect on A-Basin’s skier density, lift lines and snow safety, as mentioned in the Purpose and Need. Even though vegetation removal would be limited to the chairlift clearing corridor, the amount of skiers in the area would still impact lynx and the quality of lynx habitat.

### **ALTERNATIVE EMERGENCY EGRESS ROUTE**

An alternative emergency egress route was considered that would be located further downhill into the drainage, towards Highway 6. This route was dismissed because the alignment included in the Proposed Action accommodates snowcat/grooming access and allows adequate space for evacuations. Additionally, the alignment in the Proposed Action is located slightly uphill from this alternative, thereby avoiding sensitive resources including streams, wetlands, lynx habitat, and boreal toad habitat.

## E. COMPARISON OF ALTERNATIVES

Table 2-3 provides a comparison of project elements associated with each alternative.

**Table 2-3:  
Summary Comparison of Projects – Alternatives 1 and 2**

Component	Alternative 1	Alternative 2
<b>CHAIRLIFTS (NEW AND REPLACED)</b>		
Beavers	N/A	Included
Zuma Access (surface lift)	N/A	Included
Molly Hogan	As exists	Replaced
Pallavicini	As exists	Replaced
Norway	As exists	Removed
<b>SKIABLE TERRAIN IN THE BEAVERS</b>		
Trails B-2 and B-4	N/A	26 acres lift-served
Beaver Bowl	Backcountry	91 acres lift-served
Tree Skiing (Trails B-1 and B-3, Areas A, B and C)	Backcountry	69 acres of improved lift-served tree skiing
Steep Gullies	Backcountry	153 acres hike-back
<i>Total</i>	<i>N/A</i>	<i>338 acres</i>
<b>OTHER PROPOSED PROJECTS</b>		
Backcountry Skiing Accessible from the SUP area	<ul style="list-style-type: none"> <li>• Beavers/Steep Gullies</li> <li>• The Rock Pile</li> <li>• Thurman's Bowl</li> <li>• Montezuma Road</li> </ul>	<ul style="list-style-type: none"> <li>• The Rock Pile</li> <li>• Thurman's Bowl</li> <li>• Montezuma Road</li> </ul>
Misc. Terrain Improvements	N/A	<ul style="list-style-type: none"> <li>• Grading at top of Pallavicini chairlift</li> <li>• Grading between Beavers and Zuma Access surface lift top terminals</li> </ul>
Multi-Season Recreational Activities	N/A	<ul style="list-style-type: none"> <li>• Challenge Course</li> <li>• Canopy Tour</li> </ul>
Explosives Magazine/Makeup Room at the Steep Gullies	N/A	Included
Picnic Table Decks in the Beavers	N/A	2
Snow Plume Refuge Expansion	N/A	300 square feet
Forest Plan Consistency	N/A	Potentially Inconsistent with ALL S1

## F. SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Per direction provided in 40 CFR 1502.14, Table 2-4 provides a comparison of environmental impacts by alternative.

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2												
RECREATION													
The Proposed Action would convert hundreds of acres of popular backcountry terrain that is easily accessible from the ski area into lift-served terrain. Furthermore, lift-serving this area would alter the terrain distribution by ability level breakdown, and change skier circulation patterns throughout A-Basin’s SUP area. These changes, combined with the addition of multi-season recreation opportunities (such as the canopy tour and challenge course), would change the recreational experience within the A-Basin SUP area.													
Indicator: Quantification (skiers/day) of existing backcountry use of the Beavers													
Backcountry use in the Beavers (including Steep Gullies):	Under Alternative 2, terrain in the Beavers would be incorporated into A-Basin’s operational and would no longer be backcountry terrain. The backcountry access point to the Rock Pile would be maintained.												
<table><tr><th>Season</th><th>Total Skiers</th><th>Average Skiers per Day</th></tr><tr><td>2011/12</td><td>2,324</td><td>6</td></tr><tr><td>2012/13</td><td>16,640</td><td>29</td></tr><tr><td>2013/14</td><td>13,291</td><td>20</td></tr></table>		Season	Total Skiers	Average Skiers per Day	2011/12	2,324	6	2012/13	16,640	29	2013/14	13,291	20
Season		Total Skiers	Average Skiers per Day										
2011/12		2,324	6										
2012/13		16,640	29										
2013/14	13,291	20											
Indicator: Quantification (acres) of backcountry terrain in the Beavers													
Existing backcountry terrain in the Beavers totals approximately 500 acres.	Under Alternative 2, terrain in the Beavers would be incorporated into A-Basin’s operational and would no longer be backcountry terrain. The backcountry access point to the Rock Pile would be maintained.												
Indicator: Narrative discussion of backcountry use of the Beavers (e.g., access, dispersion and egress)													
The Beavers terrain is currently accessible from the Pallavicini and Zuma chairlifts via backcountry access points. Skiers descend a wide variety of paths and typically exit the terrain onto Highway 6, where they hitchhike back to A-Basin’s base area.	Under Alternative 2, terrain in the Beavers would be incorporated into A-Basin’s operational and would no longer be backcountry terrain. The backcountry access point to the Rock Pile would be maintained.												
Indicator: Quantification of existing and proposed terrain distribution (acreage) by ability level in relation to A-Basin’s skier market													
Beginner: 1.6 acres (1%) Novice: 26.8 acres (16%) Low-Intermediate: 46.1 acres (17%) Intermediate: 67.0 acres (16%) Advanced-Intermediate: 263.4 acres (31%) Expert: 270.9 (19%)	Beginner: 1.6 acres (1%) Novice: 26.8 acres (15%) Low-Intermediate: 46.1 acres (16%) Intermediate: 79.7 acres (18%) Advanced-Intermediate: 286.6 acres (32%) Expert: 272.8 (18%)												
Indicator: Discussion of skier circulation under existing and proposed conditions													
Two deficiencies in skier circulation have been identified relating to access to Montezuma Bowl and the aging chairlift network. Skiers accessing Montezuma Bowl from the Lenawee Mountain chairlift currently are required to traverse a long flat road. The Pallavicini, Molly Hogan, and Norway chairlifts are reaching the end of their operational lifetime and are difficult to maintain.	The installation of the Zuma Access surface lift would improve skier circulation between Montezuma Bowl and the Lenawee Mountain chairlift. Chairlift replacement/removal projects would improve the reliability of chairlifts, thereby improving skier circulation.												

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<i>Indicator: Discussion of multi-season recreation opportunities at A-Basin under existing and proposed conditions</i>	
Current multi-season recreation opportunities at A-Basin include limited hiking and mountain biking, events at the Black Mountain Lodge, and lunches in the A-Frame base lodge.	Under Alternative 2, a canopy tour would be constructed on the front side of the ski area, and a challenge course would be built near the base area. These activities would provide additional opportunities for natural resource-based recreation suitable for a wide range of users at A-Basin.
<i>Indicator: Description of A-Basin's snow safety program under existing and proposed conditions</i>	
Under existing conditions, Ski Patrol practices avalanche control (including the use of explosives) throughout the operational boundary. Patrol stations exist at the base area, mid-mountain and summit patrol headquarters. Ski Patrol responds to calls in the Beavers terrain but does not actively patrol nor practice avalanche control in this terrain.	Alternative 2 would expand the existing Ski Patrol practices, avalanche control, and patrolling into the Beavers terrain.
<b>SOCIAL AND ECONOMIC RESOURCES</b>	
<b>In both the short- and long-term, proposed projects could directly and cumulatively affect employment, personal income (i.e., wages), schools, use of public/social services and workforce housing in Summit County.</b>	
<i>Indicator: Current and potential direct employment related to A-Basin's operations</i>	
<u>Current Employees:</u> Full-time year-round: 55 Full-time winter seasonal: 198 Part-time winter seasonal: 147 Full-time summer seasonal: 13 Part-time summer seasonal: 17	<u>Potential Employees:</u> Full-time year-round: 21 Full-time winter seasonal: 19 Full-time summer seasonal: 3
<i>Indicator: Quantification of employee/workforce housing available to A-Basin's employees</i>	
<u>Existing Summit County Housing Units:</u> Occupied: 12,028 Vacant: 18,246 <u>Existing A-Basin Housing:</u> 28 beds	<u>Housing Units would remain the same as Alternative 1.</u> <u>Additional employees could potentially increase the population of Summit County and, therefore increase the demand for workforce housing.</u> While housing availability in Summit County is an ongoing issue, the Proposed Action is not anticipated to measurably affect the housing market in Summit County. The majority of workers are anticipated to already be living in the area, and employee housing provided by A-Basin could be utilized to accommodate a portion of the new employees.
<i>Indicator: Existing and potential demand for public services as a result of A-Basin's operations</i>	
While demand is high, public services are not at capacity in Summit County.	A-Basin's proposed operations (winter, summer, year-round) would require additional employees. It is anticipated that in the context of predicted population growth trends in Summit County, these additional employees would have a negligible impact on the availability of social services.

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<b>SKI AREA ACCESS AND PUBLIC SAFETY</b>	
<b>Implementation of proposed projects may generate measureable increases in daily/seasonal visitation, thereby affecting traffic on Highway 6 and parking at A-Basin</b>	
<i>Indicator: Estimated baseline and future traffic contributions to Highway 6 as related to A-Basin's operations, during summer and winter months</i>	
<p>A-Basin's guest CCC of 3,780 generates an average of approximately 825 vehicles and 1,650 vehicle trips per day throughout the ski area's winter operating season on Highway 6 east of the ski area. Guests traveling from the west on Highway 6 contribute 550 vehicles to the roadway and 1,100 vehicle trips per day throughout the ski area's winter operating season. It is important to note A-Basin is not operating at CCC every day of winter operation. CCC is generally comparable to the tenth busiest day of the ski season.</p> <p>With no current operating summer recreation activities, A-Basin currently has no measureable effect on summer traffic.</p>	<p>Under Alternative 2 the proposed projects would increase A-Basin's CCC from 3,780 to 4,140 (an additional 360 guests or 9.5%). Alternative 2 would generate an additional 79 vehicles on the roadway and 158 vehicle trips per day throughout the ski area's winter operating season on Highway 6 east of the ski area. Guests traveling from the west on Highway 6 would contribute an additional 52 vehicles on the roadway and 104 vehicle trips per day throughout the ski area's winter operating season.</p> <p>Traffic levels are not expected to increase due to the proposed projects. The proposed projects would primarily draw visitation from passing traffic.</p>
<i>Indicator: Quantification of parking capacities, and demands, at A-Basin, during summer and winter months</i>	
<p>The current parking capacity at A-Basin is 1,910. Sufficient parking would continue to be available during summer and winter months.</p>	<p>At a CCC of 4,140 guests, A-Basin would need to accommodate 1,505 vehicles. Therefore, the existing parking would be sufficient on the CCC or tenth busiest day. On peak days during the spring, A-Basin would continue to utilize the Keystone Resort parking lot through an agreement with Vail Resorts.</p>
<i>Indicator: Estimated number of people hitchhiking along Highway 6 after descending from the Beavers</i>	
<p>Currently, the majority of backcountry skiers emerge from the Beavers at the "Ski Area 1 Mile" sign and/or the Runaway Truck Ramp, depending on their trail selection. It is estimated that approximately 9,304 skiers hitchhike on Highway 6 back to A-Basin each winter (assumed 70% of the approximately 13,291 annual skiers in this area).</p>	<p>Under the Proposed Action, all skiers and riders in the Beavers and Steep Gullies area would have the ability to either ski to the bottom terminal of the Beavers chairlift or take one of the three egress's back to Pallavicini chairlift. With these well-defined and easily accessible routes there would be many fewer skiers hitchhiking back to the base area on Highway 6.</p>
<i>Indicator: Narrative discussion of access to and safety issues in the Beavers</i>	
<p>The Beavers area would continue to exist as backcountry terrain, guests who decide to ski this terrain would do so at their own risk and would likely continue to hitchhike back to A-Basin's base area. The large volume of hitchhikers on Highway 6 poses threats to guest and motorist safety.</p>	<p>The incorporation of the Beavers terrain into A-Basin's operational boundary would greatly increase public safety along Highway 6. By providing routes back to lift-served skiing and incorporating the Beavers terrain into A-Basin's operational boundary, the need for guests to hitchhike as previously associated with skiing this area is removed. By drastically reducing the number of guests hiking and hitchhiking along Highway 6, the safety of motorists and A-Basin visitors alike would be improved.</p>

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<b>SCENERY</b>	
<b>The SIO of the A-Basin SUP area could be impacted through construction of the Beavers chairlift, trails, tree skiing areas and cable-based multi-season recreation activities.</b>	
<i>Indicator: Discussion of the existing scenic integrity of the A-Basin SUP area and potential changes to this condition</i>	
The existing scenic integrity of the front side of the ski area is <i>Very Low</i> , and the Beavers area is <i>Very High</i> . Under Alternative 1 there would be no changes to the visual characteristics of the A-Basin SUP area.	Under Alternative 2, proposed projects on the front side of A-Basin would add incrementally to the developed character of the SUP area. Proposed projects in the Beavers would introduce ski area infrastructure and associated visual impacts in a currently undeveloped area.
<i>Indicator: Discussion of the SIO for the A-Basin SUP, as defined by the 2002 Forest Plan</i>	
The SIO of A-Basin's SUP area is <i>Low</i> ("appears moderately altered") in the Beavers, and <i>Very Low</i> ("appears heavily altered") on the front side.	N/A
<i>Indicator: Compliance with Forest Plan standards and guidelines for scenery management within the SUP area and from established viewpoints (analyzed through visual simulations) by meeting the SIO</i>	
The SUP would continue to meet, and in some cases exceed, the SIO of <i>Low</i> and <i>Very Low</i> .	<p>The SUP would continue to meet the SIO of <i>Low</i> and <i>Very Low</i>. None of the proposed projects on the front side are expected to increase visual impacts such that this area would not meet the SIO of <i>Very Low</i>. Proposed projects in the Beavers would not increase visual impacts such that the area would not meet the SIO of <i>Low</i>.</p> <p>The four visual simulations from the identified viewpoints illustrate that the projects on the front side of the ski area would add incrementally to the developed nature of this area of the SUP. Proposed projects in the Beavers would introduce ski area infrastructure to a currently undeveloped area, resulting in an impact to motorists driving on Highway 6.</p>
<i>Indicator: Compliance with the intent of the BEIG for all proposed structures. Structures should meet Forest Plan scenery guidelines for materials, colors and reflectivity</i>	
Alternative 1 does not include any new projects.	Proposed structures would use wooden and natural-looking materials whenever possible. Final structure designs would comply with the intent of the BEIG.
<i>Indicator: Compliance with Forest Service Manual 2343.14(1) scenery criteria</i>	
Alternative 1 does not include multi-season recreation projects.	Based on proposed locations and activity designs, the projects would be visually consistent with and subordinate to the ski area's existing facilities, vegetation, and landscape.

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<b>CULTURAL RESOURCES</b>	
<b>Proposed ground disturbing activities have potential to affect known or unidentified cultural resources in the Analysis Area.</b>	
<i>Indicator: Summary of cultural surveys that have been completed throughout the area of potential effects and potential impacts.</i>	
One newly recorded isolated feature, one previously recorded prehistoric site were found within the APE.	All inventory reports were submitted to the State Historic Preservation Officer (SHPO) in completion of the NHPA Section 106 process. SHPO concurrence regarding this project was received on October 7, 2014. There would be no adverse effects to historic/cultural properties.
<b>VEGETATION</b>	
<b>Issue #1: Ground disturbance associated with construction of proposed projects could affect plant communities throughout the Analysis Area, including TES species, WRNF SIVC, SOLC, and invasive plant species.</b>	
<b>Issue #2: The majority of overstory vegetation associated with proposed glading and trail construction in the Beavers is Engelmann spruce and subalpine fir. Spruce bark beetle population buildup is a concern if spruce trees are cut and scattered in the understory of the forest canopy.</b>	
<i>Indicator: Identification of TES plant habitat/individuals in the Analysis Area</i>	
No occupied habitat for any Threatened, Endangered or Forest Service R2 Sensitive species was observed.	There would be no impacts to federally listed Threatened and Endangered species. However, due to the remote possibility that Forest Service R2 sensitive moonworts could occur in the Analysis Area, a determination of <b><i>May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing (MAII)</i></b> was made for two R2 sensitive <i>Botrychium</i> spp. ( <i>Botrychium ascendens</i> and <i>B. paradoxum</i> ). A determination of <b><i>No Impact</i></b> was made for the other 22 sensitive plants carried forward in the analysis.
<i>Indicator: Identification of WRNF SIVC and SOLC habitat/individuals in the Analysis Area</i>	
<p>No occupied habitat for any SIVC was observed.</p> <p>A total of ten SOLC were documented. These include <i>Aquilegia saximontana</i>, <i>Botrychium echo</i>, <i>B. lanceolatum</i>, <i>B. minganense</i>, <i>B. neolunaria</i>; <i>Carex gynocrates</i>, <i>Chionophila jamesii</i>, <i>Draba crassa</i>, <i>Draba spectabilis</i> and <i>Lycopodium annotinum</i>.</p> <p>Note: Because <i>Botrychium</i> spp. occur in mixed species aggregations and may not emerge every year, it is possible that the Forest Service R2 listed moonworts (<i>Botrychium ascendens</i> and <i>B. paradoxum</i>) may be present among populations of common moonworts described above.</p>	<p>There would be no impacts to plant SIVC.</p> <p>There would be no impact to <i>Carex gynocrates</i>. However, for the other nine SOLC, there would be a direct impact to 9% of occupied habitat. Impacts vary by species. However, the impacts are not expected to be of sufficient scale or intensity to compromise the viability of these SOLC range-wide.</p>

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<i>Indicator: Existing vegetation composition and area (acreage) of proposed ground disturbance and overstory vegetation removal by species/vegetation type</i>	
A-Basin's SUP area is composed of the following vegetative communities: Spruce/Fir: 43% Forb: 17% Grass: 13% Lodgepole Pine: 3% Willow: 1% (The remaining 23% of the SUP area is characterized as Barren or Rock.)	Proposed ground disturbance and overstory vegetation removal would occur in the following vegetative communities: Spruce/Fir: 183 acres 22 acres of vegetation removal and/or grading 161 acres of tree skiing (including the Steep Gullies), which would include minimal disturbance/tree removal Grass: 67 acres Forb: 13 acres
<i>Indicator: Identification of BMPs to prevent any spruce bark beetle population buildup, thereby protecting the surrounding spruce/fir landscape, maintaining scenic integrity of live vegetation, and not contributing to potential future higher ground fuel loading</i>	
No spruce trees would be cut; therefore, Alternative 1 would not create a risk of spruce beetle infestation.	Table 2-2 includes PDC for the proper treatment of downed spruce trees to minimize the risk of spruce beetle colonization and infestation. Downed spruce trees would either be removed, burned, or treated such that they would not create suitable conditions for colonization.
<b>WILDLIFE AND AQUATICS</b>	
<b>Issue #1: Terrestrial TES, MIS, and migratory birds could be affected by proposed ground disturbance, vegetation removal and increases in use associated with the Beavers projects and multi-season recreation activities.</b>	
<b>Issue #2: Increased annual visitation resulting from implementation of the Proposed Action would lead to more vehicles on Highway 6, which could impair Canada lynx movement.</b>	
<i>Indicator: Quantification (acres) and qualification of existing TES and MIS wildlife habitat and proposed alteration, fragmentation, or removal of wildlife habitat, by species. Include specifically lynx diurnal security habitat, winter forage habitat, and denning habitat</i>	
No impacts would occur under Alternative 1. Existing conditions include: <b>TES:</b> <u>Uncompahgre fritillary butterfly, yellow-billed cuckoo, humpback chub, bonytail Colorado pikeminnow, razorback sucker, greenback cutthroat trout:</u> No habitat or no additional depletions. <u>Canada lynx:</u> Diurnal Security Habitat – 0 acre within the Project Area Winter Foraging Habitat – 299.9 acres within SUP area Denning Habitat – 433.3 acres within SUP area <b>R2 Sensitive Species:</b> Refer to Table 3G-3 for species with and without potential habitat. <b>MIS:</b> Refer to Table 3G-4 for species with and without potential habitat.	<b>TES:</b> Alternative 2 impacts to lynx habitat types would total 162.5 acres. Diurnal Security Habitat – 0 acre affected Winter Foraging Habitat – 101.2 acres affected Denning Habitat – 61.3 acres affected <b>R2 Sensitive Species:</b> Determinations presented in Table 3G-6. <b>MIS:</b> <u>American Elk:</u> Negative effects would occur on elk summer use. The effects would not be measurable on habitat effectiveness within the DAU or elk population parameters at the Forest level. <u>American Pipit:</u> Proposed Action would not measurably contribute to any negative trend in the forest-wide population or habitat trend of this MIS that would affect achieving Forest Plan MIS objectives. <u>Aquatic Macroinvertebrates and Trout:</u> Maintained with PDC.

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<i>Indicator: Identification of impacts to avian wildlife, in particular to the construction and maintenance of the multi-season recreation activities.</i>	
No impacts.	Avian nesting and foraging effectiveness could be impaired adjacent to the zip line activity corridors and while some affected birds could experience reduced recruitment, such potential effects would be limited to a low number of individual birds.
<i>Indicator: Quantification and analysis of TES and MIS aquatic habitat (including fish, amphibians, and macroinvertebrates) in the Analysis Area</i>	
See above for aquatic species. No impacts would occur.	See above for aquatic species impacts.
<i>Indicator: Quantification of acreage compacted in the WIZ</i>	
0 acre	0.43 acre
<i>Indicator: Quantification of riparian vegetation disturbed and/or removed</i>	
0 acre	2.91 acres of overstory vegetation removal within the WIZ
<i>Indicator: Quantification of individuals/populations of boreal toads impacted</i>	
No impacts. A breeding site near the North Fork Snake River supports one population with eight recorded individuals.	No direct impacts to the breeding site would occur. PDC would address potential movement related impacts to boreal toads due to timing restriction on construction and operation of the emergency egress route.
<i>Indicator: Quantification of impacts to water and downstream populations of big river fish</i>	
No impacts.	Approximately 13 acre feet of additional water depletions would occur on an annual basis. This amount has been previously consulted on through Section 7.
<b>SOILS</b>	
<b>Ground disturbance associated with construction of proposed projects has potential to increase erosion and soil compaction and lower soil productivity through soil organic matter and mineral losses in the Analysis Area.</b>	
<i>Indicator: Discussion of soil conditions and baseline inventory</i>	
Table 3G-2 provides a baseline inventory within A-Basin's SUP boundary.	Table 3G-3 identifies soils that would be affected under the Proposed Action.
<i>Indicator: Identification and quantification (acres) of temporary and permanent ground disturbance</i>	
No ground disturbance would occur as a result of approving Alternative 1.	Table 3G-3 quantifies the amount of disturbance associated with the Proposed Action. In total approximately 79 acres would be disturbed under this alternative including 22.4 acres of clearing, 5.8 acres of grading, 2.8 acres of tree removal and grading and 48 acres of thinning for tree skiing. Permanent ground disturbance would total less than 0.1 acre resulting from grading for access paths and installation of infrastructure.
<i>Indicator: Analysis of erosion susceptibility based on K-factor ratings and mitigation opportunities based on identification of existing bare ground areas within the SUP in need of rehabilitation</i>	
K-factor ratings within the SUP are no higher than 0.15 Kw indicating low surface and subsurface erodibility potential.	K-factor ratings for this alternative are low in surface and subsurface erodibility potential, ranging from 0.10 to 0.15 Kw.

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2										
<i>Indicator: Digitization of bare ground/low vegetation cover areas within SUP area</i>											
Intentional bare ground: 58 acres Natural bare ground: 874 acres Rehab bare ground: 42 acres	Intentional bare ground: 58 acres Natural bare ground: 874 acres Rehab bare ground: 42 acres										
<i>Indicator: Discussion of soil stability and mass movement potential</i>											
Although generally low, soil stability and mass movement potential within the SUP boundary ranges from slight to severe.	The majority of proposed project locations overlap areas of “slight” to “low” mass movement potential and projects could be implemented without special design considerations in these areas. Some of the projects would be constructed within or near areas that have been identified as having “moderately high” stability risk including portions of the trails associated with the Steep Gullies. Construction of the proposed trails in this area would require minimal tree removal and no ground disturbance.										
<b>WATER RESOURCES</b>											
<b>Implementation of terrain modifications associated with proposed projects (particularly vegetation removal and grading) has the potential to affect stream and riparian health.</b>											
<i>Indicator: Anticipated changes in water yield (acre feet) and peak flows (cfs), and subsequent watershed effects</i>											
No impact.	Implementation of the proposed projects would require removal of between 1% and 14% of trees, relative to current conditions, in the study watersheds. As discussed in Chapter 3, changes in water yield or peak discharge are generally undetectable or insignificant when tree removal levels are below 25%.										
<i>Indicator: Discussion of the effects to stream health within the context of the following stream health metrics: bank stability, fine sediment, residual pool depth, wood frequency, and macroinvertebrates</i>											
No change to existing health ratings: <table border="1"> <thead> <tr> <th align="center" colspan="2">North Fork Snake River</th></tr> </thead> <tbody> <tr> <td align="center">Percent Fine Sediments</td><td align="center">Robust</td></tr> <tr> <td align="center">Residual Pool Depth</td><td align="center">Robust</td></tr> <tr> <td align="center">Unstable Banks</td><td align="center">At-Risk</td></tr> <tr> <td align="center">Large Woody Debris</td><td align="center">Robust</td></tr> </tbody> </table>	North Fork Snake River		Percent Fine Sediments	Robust	Residual Pool Depth	Robust	Unstable Banks	At-Risk	Large Woody Debris	Robust	<p>The North Fork Snake River stream channel has been rated as “Robust” for percent of fine sediments, residual pool depth, and large woody debris; the unstable banks metric was classified as at-risk.</p> <p>Stream bank stability is negatively impacted by increases in water yield and peak flow. No measurable increases in water yield and peak flow is anticipated to occur with implementation of the proposed projects.</p> <p>The percent fine sediments, residual pool depth, and large woody debris metrics are mostly affected by impacts to the WIZ and increases in CDA. CDA is not expected to increase.</p> <p>With the implementation of the PDC outlined in Table 2-2, the proposed projects would not have a negative impact on the health of North Fork Snake River.</p>
North Fork Snake River											
Percent Fine Sediments	Robust										
Residual Pool Depth	Robust										
Unstable Banks	At-Risk										
Large Woody Debris	Robust										

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<i>Indicator: Quantification of extent of temporary and permanent impacts to the WIZ (acres) and discussion of how this affects stream health</i>	
No impact.	<p>Projects would be constructed near stream channels, requiring approximately 2.91 acres of tree removal within the WIZ and 0.43 acre of grading. These acreages represent 3.0% and 0.4% of the existing WIZ.</p> <p>Tree removal and terrain grading within the WIZ have the potential to negatively affect stream health. Implementation of PDC shown in Table 2-2 would help to maintain or improve stream health of A-Basin's streams, including the North Fork Snake River.</p>
<i>Indicator: Quantification of changes in CDA (acres and linear feet) and discussion of how this affects stream health</i>	
No change to existing extent of CDA (0.52 acre; 1,485 linear feet).	<p>The approximately 0.4 acre (about 880 linear feet) of terrain grading that would occur within the WIZ has the potential to increase CDA. An increase in CDA could impact stream health by increasing peak flows and by providing a source and path for sediments to flow into the stream.</p> <p>Implementation of the PDC outlined in Table 2-2 would avoid the increase in CDA.</p>
<i>Indicator: Quantification and discussion of existing drainage concerns and treatment areas, including areas of rilling and gullyng</i>	
No change to existing drainage conditions is anticipated to occur under Alternative 1.	<p>With the implementation of the PDC outlined in Table 2-2 there would be minimal impacts to drainage conditions and no areas of rilling and gullyng would result from construction of the proposed projects.</p> <p>Current drainage conditions were evaluated along the mountain roads, existing graded areas, and near the location of proposed projects. No areas of rilling and gullyng were observed. However, there exist opportunities for re-vegetation and drainage improvement projects.</p>
<i>Indicator: Development and analysis of drainage management measures to maintain or improve stream health, and to prevent erosion and mass movement</i>	
No impacts.	PDC outlined in Table 2-2 include measures to maintain stream health and prevent erosion. Additionally, the Forest Service and A-Basin would coordinate to implement drainage management projects to improve drainage conditions.
<i>Indicator: Evaluation of compliance with Watershed Conservation Practices Handbook and Forest Plan requirements</i>	
No impacts.	Implementation of PDC outlined in Table 2-2 would ensure compliance with WCPH and Forest Plan requirements.

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

Alternative 1	Alternative 2
<b>WETLANDS</b>	
<b>Proposed ground disturbance and overstory vegetation removal has potential to affect wetland function and values within the Analysis Area.</b>	
<i>Indicator: Identification of wetlands across the Analysis Area in relation to proposed projects</i>	
A total of 75.7 acres of wetlands occur within the 995 acre Analysis Area, including 14.9 acres of forested wetlands, 54.8 acres of scrub-shrub wetlands, and 5.6 acres of emergent wetlands. In addition, there is a 0.4-acre pond.	Same as Alternative 1.
<i>Indicator: Description of compliance with EO 11990, Protection of Wetlands</i>	
Not applicable.	In compliance with EO 11990, all long- and short-term adverse impacts to wetlands would be avoided and minimized to the most practicable extent possible.
<i>Indicator: Narrative description of potential effects to wetland functions and values related to proposed ground disturbance and overstory vegetation removal</i>	
No effects to functions and values of wetlands would occur.	<p>Direct impacts to wetlands include a 0.062 acre permanent wetland impact and 0.060 acre temporary wetland impact. All permanent and temporary wetland impacts would be mitigated per terms and conditions of a USACE CWA Section 404 Permit and hence there would be no net loss of wetlands or their functions and values.</p> <p>There would be 1.71 acres of indirect impacts to wetlands mainly through forest overstory removal which would increase light regime and potentially alter the plant species composition for forested wetlands. In addition, snow compaction due to snowcat grooming and snowmobiling may affect wetland fens through decreased soil temperatures and/or delayed snowmelt. Finally, scrub-shrub wetland communities may be structurally altered by the trimming of tall willows and other shrubs. Overall, these secondary impacts when combined with the PDC listed in Table 2-2 will not measurably affect the functions and values of the wetlands.</p>
<i>Indicator: Identification of ways to avoid, minimize, and mitigate impacts to wetlands</i>	
Not applicable.	<p>Several PDC would be implemented to avoid, minimize and mitigate wetland impacts:</p> <ol style="list-style-type: none"> <li>1. A CWA Section 404 Permit would be obtained from the USACE prior to disturbance of any waters of the U.S., including wetlands. The 404 Permit may require the preparation and approval of a mitigation plan for impacts wetlands or other WOUS. This mitigation plan will also be submitted, reviewed and must be approved by the Forest Hydrologist prior to implementation.</li> <li>2. Coordinate with the Forest Service Hydrologist for any proposed temporary crossing of wetlands during tree removal in the Beavers Area and along the emergency egress and hike-back routes. Ensure that any wetland impacts are avoided or minimized to the most practicable extent possible and that no adverse effects occur.</li> </ol>

**Table 2-4:  
Summary Comparison of Direct and Indirect Environmental Consequences**

<b>Alternative 1</b>	<b>Alternative 2</b>
	<ul style="list-style-type: none"><li>3. Any wetlands to be avoided within and adjacent to Project Area activities will be delineated and flagged by a qualified individual prior to construction.</li><li>4. Flush-cut and leave stumps and root wads intact within wetlands, except in areas identified for grading activities.</li><li>5. Slash and debris will not be placed in wetlands. Utilize BMPs to prohibit sediment migration from ground disturbances into wetlands or streams.</li></ul>

## **G. IDENTIFICATION OF THE PREFERRED ALTERNATIVE**

The Preferred Alternative is the alternative which the agency believes would best fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. At this time, considering the environmental impacts to public lands and the opportunities for use of those lands that would benefit the most people over the longest term, the Responsible Official has identified Alternative 2 as the Preferred Alternative.

Following review of public and agency comments on this DEIS, the Responsible Official will make a final determination as to which alternative, in part or in whole, best serves the public interest on NFS lands. Based on public and agency comments, modification of the preferred alternative may occur between DEIS and the FEIS.

# **Chapter 3**

## **Affected Environment and Environmental Consequences**

---

### **3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

#### **INTRODUCTION**

CEQ regulations direct agencies to succinctly describe the environment that may be affected by the alternatives under consideration.<sup>28</sup> As such, Chapter 3 describes the existing physical, biological, social, and economic components of the Project Area which have potential to be affected by implementing any of the alternatives (i.e., the Affected Environment). Each Affected Environment description is followed by an Environmental Consequences discussion that provides an analysis of the potential effects of implementation of each of the alternatives.

Chapter 3 is organized by resource area, and follows the organization of issues and resources requiring further analysis (and indicators) as presented in Chapter 1. Each resource section in Chapter 3 is organized in the following order:

#### **SCOPE OF THE ANALYSIS**

The scope of the analysis briefly describes the geographic area(s) potentially affected by the alternatives for each issue and its indicator(s). The scope of analysis varies according to resource area and may be different for direct, indirect, and cumulative effects.

#### **AFFECTED ENVIRONMENT**

The Affected Environment section provides a description of the environment potentially affected, as based upon current uses and management activities/decisions.

#### **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

This section provides an analysis of direct and indirect environmental effects of implementing each of the alternatives, according to the issues or resources requiring additional analysis and indicators identified in Chapter 1. Cumulative effects are discussed separately.

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable (i.e., likely to occur within the duration of the project).

---

<sup>28</sup> 40 CFR 1502.15

## **CUMULATIVE EFFECTS**

Cumulative effects are the result of the incremental direct and indirect effects of any action when added to other past, present, and reasonably foreseeable future actions, and can result from individually minor but collectively major actions taking place over a period of time. Past, present and reasonably foreseeable future actions are identified in Appendix A.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

An irreversible commitment is a permanent or essentially permanent use or loss of resources; it cannot be reversed, except in the extreme long-term. Examples include minerals that have been extracted or soil productivity that has been lost. An irretrievable commitment is a loss of production or use of resources for a period of time. One example is the use of timber land for a logging road. Timber growth on the land is irretrievably lost while the land is a road, but the timber resource is not irreversibly lost because the land could grow trees in the near future. The Forest Service recognizes the fact that certain management activities will produce irreversible or irretrievable commitments of resources.

## **A. RECREATION**

### **SCOPE OF THE ANALYSIS**

The scope of this analysis of recreational opportunities extends to winter and summer uses at A-Basin on NFS lands within the ski area's 1,872-acre SUP boundary. The majority of A-Basin's on-mountain operations are conducted on public lands administered by the WRNF. This analysis defines the existing recreational opportunities within the A-Basin SUP area, and provides an analysis of potential changes in the recreational dynamic anticipated with proposed projects. In particular, this analysis discusses backcountry use of the Beavers, terrain distribution within A-Basin's SUP, skier circulation, snow safety, and multi-season recreation opportunities.

### **AFFECTED ENVIRONMENT**

A-Basin serves a broad range of guest demographics and ability levels with a natural emphasis towards advanced ability levels and local skiers due to their accessible and challenging terrain. In addition to skiing terrain within A-Basin's operational boundary, the backcountry access points at A-Basin are popular among expert-level skiers. As discussed in Chapter 1, existing backcountry use in the Beavers and Steep Gullies (outside of A-Basin's operational boundary) poses a safety risk.

In addition to winter operations, growing numbers of summer visitors to Summit County have resulted in an increased interest in multi-season recreation opportunities at A-Basin.

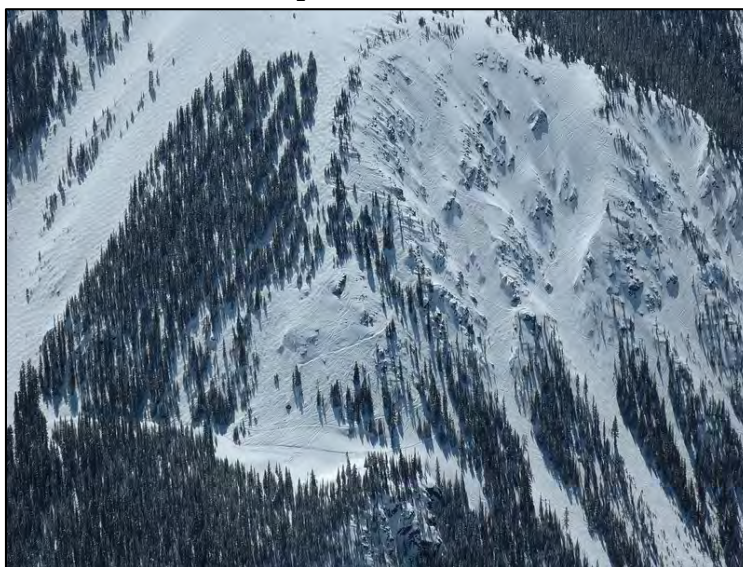
### **Beavers Backcountry Terrain**

Backcountry skiing has become increasingly popular in the last decade as a result of various technological advances in equipment, including safety equipment, and a growing interest in the unique experience.<sup>29</sup>

The backcountry offers a sense of adventure, solitude and self-awareness that simply cannot be experienced when skiing inbounds at a developed ski area and is particularly attractive to the type of skier that visits A-Basin (namely advanced and expert skiers who enjoy a natural experience).

The Beavers is one of three primary areas of backcountry terrain outside of A-Basin's operational boundary, accessed via five backcountry access points. The Beavers terrain, including the Steep Gullies, is accessed from the Pallavicini or Zuma chairlifts and totals approximately 500 acres. After exiting A-Basin's operational boundary through one of the backcountry access points, skiers descend through the terrain which is characterized by open bowls, steep chutes, and areas of trees. Photo 3A-1 illustrates the backcountry ski terrain in the Steep Gullies, seen in the right half of the photo. Skiers typically ski down the fall line to the low point near the stream south of Highway 6, where they then hike out to the road and often walk or hitchhike back to A-Basin's base area. Refer to Chapter 3, Section C – Ski Area Access and Public Safety for a discussion of skiers hitchhiking on Highway 6.

**Photo 3A-1:  
Steep Gullies Terrain**



This terrain is popular among advanced and expert-level skiers and experiences heavy use throughout the season. The visibility (from Highway 6) and accessibility (from A-Basin's chairlift network) of this area as well as the quality of terrain contribute to this heavy use. A study performed for this analysis indicates that backcountry use in the Beavers totaled approximately 2,324 total skiers (approximately 6 skiers per day) during the 2011/12 season, approximately 16,640 total skiers (approximately 29 skiers per day)

---

<sup>29</sup> USDA Forest Service 2012

during the 2012/13 season, and approximately 13,291 total skiers (approximately 20 skiers per day) during the 2013/14 season.<sup>30</sup> This heavy use is visible in Photo 3A-1, where numerous ski tracks are visible in the Steep Gullies in the right half of the photo.

Since the Beavers is outside of A-Basin's operational boundary, avalanche safety procedures are not enforced. Therefore, the high level of use in this area creates a significant safety concern. As addressed by the WRNF 2002 Forest Plan FEIS, "avalanche risk to the public is potentially high. The risk could be partially mitigated if the Beavers site was developed for skiing as part of the ski area."<sup>31</sup> Since 1982 there have been six avalanche fatalities recorded in the Beavers.<sup>32</sup> Although the Beavers is located outside of the operational boundary, A-Basin ski patrol does respond to approximately three to five incidents per year.

### **A-Basin Terrain Network**

A-Basin's existing terrain network encompasses approximately 958 skiable acres, including approximately 282 acres of hike-to/hike-back terrain and approximately 676 acres of maintained and groomed ski trails. The developed ski trail network accommodates the entire range of skier ability levels from beginner to expert.

Table 3A-1 illustrates the distribution of terrain by skier ability level for the developed trail network, as well as the distribution of the active skier population at A-Basin. The terrain distribution is compared to both A-Basin's actual market and to the industry norm market. Note that A-Basin's actual market is considerably different than the industry norm, in that it is skewed toward advanced ability levels.

**Table 3A-1:**  
**Lift-Served Terrain Distribution by Ability Level – Existing Conditions**

<b>Skier/Rider Ability Level</b>	<b>Trail Area (acres)</b>	<b>Skier/Rider Capacity (guests)</b>	<b>Skier/Rider Distribution (%)</b>	<b>A-Basin Market (%)</b>
Beginner	1.6	57.1	1	2
Novice	26.8	669.3	16	7
Low-Intermediate	46.1	738.2	17	18
Intermediate	67.0	670.4	16	20
Advanced-Intermediate	263.4	1316.9	31	30
Expert	270.9	812.7	19	23
<b>TOTAL</b>	<b>675.9</b>	<b>4,264</b>	<b>100</b>	<b>100</b>

Compared with the Rocky Mountain region, the skier/rider market at A-Basin is skewed to the upper ability levels. Table 3A-1 indicates that 20 percent of the A-Basin's guests fall into the intermediate

---

<sup>30</sup> Thompson, 2014

<sup>31</sup> USDA Forest Service, 2002b

<sup>32</sup> Atkins, 2015

category and 23 percent fall within the expert ability level. However, the current terrain capacities fall short of adequately accommodating these guests (at 16 and 19 percent, respectively) resulting in an imbalance between current terrain and A-Basin's unique skier/rider market.

In addition to the traditional, lift-served, trail network, advanced intermediate and expert ability level hike-to/hike-back terrain exists within the ski area boundary. The hike-to terrain is along and above the East Wall accessed by Lenawee or Zuma chairlifts. The hike-back terrain is located to the south of the Zuma chairlift in Montezuma Bowl and requires guests to hike back to the chairlift. These terrain areas encompass approximately 282 acres, and provide an undeveloped, natural, and unstructured style of terrain.

### *Skier Circulation*

Guest feedback and resort operations have identified two deficiencies in ski area circulation relating to access to Montezuma Bowl and the aging chairlift network. Currently, skiers/riders looking to access Montezuma Bowl from the Lenawee Mountain and Norway chairlifts must skate or hike a 400-foot long, slightly uphill catwalk. Moving along this catwalk is especially difficult in fresh snow or on windy days and, therefore, limits access to Montezuma Bowl for skiers who may not be able to make this traverse.

The aging network of chairlifts also contributes to skier circulation issues. Old chairlifts need more frequent repairs which can require temporary closures, thereby limiting access and potentially resulting in longer lift lines at other chairlifts. In particular, the Molly Hogan, Pallavicini, and Norway chairlifts, all installed in 1978, are near the end of their operational life and are difficult to maintain. The Pallavicini chairlift is popular and heavily used, as it services a large area of advanced and expert-level terrain. The Molly Hogan chairlift services beginner terrain in the base area, and is an important feature of the learning area. The Norway chairlift is considered redundant, as it serves the same functions as the Lenawee Mountain chairlift and is only operated during peak weekends and holidays.

The efficiency of chairlifts is important for skier circulation, as well as the calculation of a planning metric called Comfortable Carrying Capacity (CCC). Based on a comparison of uphill vertical lift supply to downhill vertical skiing demand, CCC provides a planning tool which indicates the optimum level of daily utilization for a resort. The existing CCC at A-Basin is 3,780 guests per day.

### *Ski Patrol*

Ski Patrol operations are currently located in the Snowsports Center at the base area, in the Snow Plume Refuge at the summit of Norway chairlift, and in the mid-mountain Black Mountain Lodge. Ski patrol actively monitors the entire SUP area but only patrols and enforces avalanche safety procedures inside the operational boundary. A-Basin's avalanche safety program currently includes three avalaunchers—two in the East Wall area, and one in Montezuma Bowl—and other typical methods (including ski-cutting, hand-

placed explosives, etc.) throughout the SUP area.<sup>33</sup> As the Beavers terrain is currently outside of A-Basin's operational boundary, it is not controlled for avalanche safety.

### **Multi-Season Recreation**

Current multi-season recreation opportunities at A-Basin include limited hiking and mountain biking, on-mountain events at the Black Mountain Lodge, and lunches at the A-Frame base lodge. The A-Frame is open to the public for lunch Thursday through Sunday during the summer season (approximately June to September). Approximately 25 to 30 weddings are held at the mid-mountain Black Mountain Lodge each summer. The Black Mountain Express chairlift is operated during weddings and other special events to transport guests. One hiking and mountain biking trail, the Argentine North Fork Trail, traverses the front side of A-Basin and provides opportunities for natural resource-based recreation because the natural scenery and topography are defining features of the recreational experience.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

#### *Beavers Backcountry Terrain*

Backcountry access under the No Action Alternative would not change from existing conditions. The Beavers would remain as backcountry terrain and the safety risks would persist. Access to other backcountry areas would continue via the five existing backcountry access points.

#### *A-Basin Terrain Network*

Under Alternative 1 there would be no changes to A-Basin's terrain network. The terrain network would include approximately 958 acres of skiable terrain, including approximately 282 acres of hike-to/hike-back terrain and approximately 676 acres of maintained and groomed ski trails. The deficit of intermediate and expert ability level terrain, compared with market characteristics, would persist.

### **Skier Circulation**

Skier circulation would not change from the existing condition. Travel between the Lenawee Mountain chairlift and Montezuma Bowl would still be difficult, and aging chairlifts would continue to cause skier circulation issues.

### **Ski Patrol**

A-Basin's ski patrol operation and practices would not change from the existing conditions. Occasional responses to accidents in the Beavers would continue to be difficult.

---

<sup>33</sup> An "avalauncher" is a cannon-like mechanism used to fire explosives into avalanche-prone terrain and to trigger small slides. This tool is frequently used for avalanche mitigation.

### *Multi-Season Recreation*

No changes would occur to A-Basin's multi-season recreation opportunities. Activities would continue to include limited hiking and mountain biking, events at the mid-mountain Black Mountain Lodge, and lunches at the A-Frame.

## **Alternative 2 – Proposed Action**

### *Beavers Backcountry Terrain*

Under Alternative 2, terrain in the Beavers would be incorporated into A-Basin's operational boundary and would no longer offer a backcountry experience as described in the Affected Environment. The installation of the Beavers chairlift, development of ski trails, and creation of tree skiing areas would result in increased skier use of this terrain and a more developed recreational experience. While the Beavers chairlift would allow for lift-served skiing through Beaver Bowl, because no trees would be removed in the Steep Gullies and skiers would still be required to hike out, the experience in the Steep Gullies would be more similar to the existing condition. The creation of egress routes would facilitate skiers' return to the Pallavicini chairlift, but the terrain would maintain some of its backcountry characteristics.

The incorporation of the Beavers into the operational boundary would allow for avalanche control and other safety procedures in this area, which would greatly reduce safety hazards. As discussed above, the Beavers is currently a highly-used backcountry area because of its visibility and accessibility from A-Basin's SUP area and the dangers posed by avalanches create a significant risk. By incorporating this area into the operational boundary, improved safety measures and accident response capabilities would address this concern.

By removing approximately 500 acres of backcountry terrain, it is anticipated that backcountry use of the Rock Pile and other areas both in the vicinity of A-Basin and throughout Summit and Clear Creek counties would increase. Access to the Rock Pile would be maintained through a relocated access point to the west of the new operational boundary.

### *A-Basin Terrain Network*

Under the Proposed Action, the terrain network would be expanded to include trails and tree skiing in the Beavers. Ski area terrain at A-Basin would increase by approximately 338 acres. This would include approximately 26 acres of new ski trails, approximately 91 acres of open bowl skiing, approximately 69 acres of tree skiing, and approximately 153 acres of skiing in the Steep Gullies. Table 3A-2 depicts terrain distribution by ability level.

**Table 3A-2:  
Lift-Served Terrain Distribution by Ability Level – Alternative 2**

<b>Skier/Rider Ability Level</b>	<b>Trail Area (acres)</b>	<b>Skier/Rider Capacity (guests)</b>	<b>Skier/Rider Distribution (%)</b>	<b>A-Basin Market (%)</b>
Beginner	1.6	57.1	1	2
Novice	26.8	669.3	15	7
Low-Intermediate	46.1	738.2	16	18
Intermediate	79.7	797.4	18	20
Advanced-Intermediate	286.6	1432.9	32	30
Expert	272.8	818.4	18	23
<b>TOTAL</b>	<b>713.7</b>	<b>4,513</b>	<b>100</b>	<b>100</b>

Compared to existing conditions (Alternative 1 – No Action Alternative), the Proposed Action would address the current deficit of intermediate and expert ability level terrain distribution. In particular, Trails B-2 and B-4 would add intermediate and advanced intermediate terrain in the form of defined trails. In addition to these defined trails, skiing throughout Beaver Bowl would help meet existing and future demand for high alpine and open bowl skiing while protecting and enhancing the distinctive skiing experience that A-Basin provides (as noted in the Purpose and Need in Chapter 1). Finally, tree skiing on Trails B-1 and B-3, in areas A, B, and C, and in the Steep Gullies would provide the type of expert level terrain for which A-Basin is known, and would help address the current deficit in expert level terrain.

Two picnic areas would be constructed within the Beavers terrain. These facilities would provide guests a place to rest and enjoy the mountain scenery. The picnic areas would be designed match the limited level of development in this area.

### Skier Circulation

#### Beavers Chairlift

The addition of the Beavers chairlift would improve skier circulation in the Beavers. As discussed above, while this terrain is currently outside of the operational boundary, it is highly skied. Currently, skiers in this area typically hike out to Highway 6 and hitchhike back to the base area. Not only is this dangerous (refer to Chapter 3, Section C – Ski Area Access and Public Safety), but it is also time-consuming. Installation of a chairlift would allow skiers in the Beavers to efficiently and safely ski a large area of terrain. Note that skiers descending below the bottom terminal of the Beavers chairlift in the Steep Gullies would still need to hike back to Pallavicini chairlift, but multiple egress routes would improve this access, when compared with existing conditions. The installation of the Beavers chairlift would be the primary driver for an increase in CCC at A-Basin, from 3,780 to 4,140 guests. Other details of chairlift upgrades are discussed below.

### **Zuma Access Surface Lift**

Currently, skiers unloading from the Lenawee Mountain chairlift must hike or skate approximately 400 feet along a catwalk, on an uphill grade, to reach Montezuma Bowl. The proposed Zuma Access surface lift would carry skiers along this catwalk to Montezuma Bowl, eliminating the difficult traverse. This project would improve the accessibility of Montezuma Bowl for skiers of all fitness levels and generally improve the recreational experience. Skiers travelling from Montezuma Bowl back towards the front side of A-Basin would still be required to traverse, but travel in this direction is significantly easier. There could be some traffic issues in this area if skiers are on the lift and skating in both directions, but this is anticipated to be minimal and would likely occur very rarely. Typically, the highest traffic would occur on “powder days” early in the morning when a high volume of skiers would be trying to access Montezuma Bowl simultaneously. On these occasions, there could be a lift line which could cause skier circulation issues in the vicinity of the Lenawee Mountain chairlift. However, as discussed above, it is assumed that these situations would be rare and of short duration.

### **Pallavicini Chairlift Replacement**

The Pallavicini chairlift is popular amongst A-Basin’s guests and serves as a key access point to a large network of expert level terrain. The capacity of the new chairlift would not change and, therefore, the recreational experience in this area (characterized by low skier densities) would be maintained. By replacing the chairlift with a newer fixed-grip double, the reliability of the chairlift would improve which would reduce skier circulation issues related to maintenance-related delays and closures. A newer, more reliable chairlift would also be better able to handle increased numbers of skiers traversing from the Steep Gullies terrain.

### **Molly Hogan Chairlift Replacement**

Replacing the Molly Hogan chairlift would provide more reliable access to an important area of beginner terrain at A-Basin. A new chairlift would reduce maintenance-related delays and closures, thereby improving skier circulation and the recreational experience.

### **Norway Chairlift Removal**

Currently, Norway chairlift is only operated during peak periods to ease the congestion on Lenawee Mountain chairlift. The terrain served by this chairlift is entirely redundant with the Lenawee Mountain chairlift. Because this chairlift is used very rarely and does not provide exclusive access to any terrain, its removal is not anticipated to impact the recreational experience on a typical day. On the busiest days at A-Basin when the Norway chairlift could be operated, its absence could result in increases in skier volumes on the Lenawee Mountain chairlift. However, the installation of the Beavers chairlift would likely result in a shift in skiers to this new terrain, which could offset the impact to circulation on the Lenawee Mountain chairlift.

### Ski Patrol

Under the Proposed Action, A-Basin's operational boundary would expand by approximately 495 acres. With this expansion, ski patrol would provide avalanche and safety practices in the Beavers terrain. Ski patrol would extend their current snow safety practices throughout this area, thereby improving safety and response time in the Beavers. These expansions of ski patrol activities would provide the Beavers with snow safety operations and ski patrol services consistent with statements made in the 2002 WRNF Forest Plan FEIS (as stated as in the Purpose and Need in Chapter 1).

In addition to snow safety and ski patrol services, the emergency egress route from the base area to the Beavers chairlift would facilitate the rescue and removal of injured skiers.

### *Multi-Season Recreation*

#### Resort Operations and Functions

Under the Proposed Action snow sports would be the primary focus at A-Basin. It is anticipated that summer visitation would remain significantly lower than winter visitation. In general, infrastructure that is dedicated to multi-season activities would remain subsidiary to the larger network of infrastructure that is in place to accommodate winter recreation. While the concentration of multi-season activities on the front side of the ski area would impact the atmosphere and environment in this area, as a whole, A-Basin's SUP area would still feel and function like a ski area.

The canopy tour and challenge course would be located on the front side of the ski area, the most highly developed area of the SUP area. The projects would be located in an area designated as Zone 2 in the MDP, which identifies canopy tours and challenge courses as appropriate activities. While these activities would be located within the developed ski trail network, they would have minimal effects on winter users. Most of the stations would be located on the edges of ski trails, and could have minor impacts to skiers. The challenge course would be located in small tree islands that are not frequently skied; therefore, it is anticipated that this project would have minimal impacts on winter recreation. The canopy tour and challenge course towers would be fenced on the uphill side to prevent collisions and other safety concerns, but is not expected to hinder skiable terrain.

Fencing around canopy tour and challenge course stations and guy wires would be installed to prevent collisions and other safety concerns for skiers, but this infrastructure could impact the recreational experience for skiers in the trees or trail edges near these facilities. However, as skiers in the trees are accustomed to avoiding obstacles, the impact on the recreational experience is expected to be minimal. Additionally, at the scale of the SUP area, the frequency of encounters with this infrastructure would be negligible.

The visibility of canopy tour and challenge course infrastructure could impact the winter recreational experience by detracting from the natural setting of the area. If feasible, the canopy tour and challenge course may operate during the ski season. The canopy tour and challenge course infrastructure and

operations would be visible to snow sports users as well as other summer recreationalists, including hikers and mountain bikers. Both the canopy tour and challenge course would likely have high visibility due to their proximity to popular ski terrain and the base area. In particular, the last station of the canopy tour would be located in the base area. Refer to Chapter 3, Section D – Scenery for more information.

The proposed multi-season activities would utilize the existing parking lots, access would be provided via the existing Black Mountain Express chairlift, and other guest services would be provided at the existing Black Mountain Lodge and base area facilities. No other support infrastructure would be required. It is anticipated that use of the Black Mountain Express chairlift would increase.

### **Recreational Experience**

In general, the proposed activities would provide opportunities to enjoy outdoor recreation, nature, and natural resource-based recreation. The incorporation of rappels and short hikes into the canopy tour and challenge course would provide an experience that is dependent upon the natural setting and would engage visitors with the high alpine environment. The recreational experience would be dependent upon the terrain, topography, vegetation, and scenery common in National Forest settings. These activities would provide adventure-based multi-season experiences that require little specialized knowledge, skills, equipment or familiarity with the mountain environment (as noted in the Purpose and Need in Chapter 1).

The distribution of multi-season recreation activities would remain similar to existing activities, with all activities located on the developed, front side of the ski area.

Increased noise and visual impacts from the proposed projects could impact the overall recreational experience at A-Basin. Infrastructure related to the canopy tour and challenge course could directly and indirectly impact winter recreation and would add incrementally to the modified landscape at A-Basin. However, the SUP area is currently the focus of developed and structured recreation (consistent with Management Area 8.25), so additional noise and visual impacts would be consistent with guest expectations at this location.

### **Canopy Tour**

A canopy tour combines the adventure of zip lines with a more intimate forested setting. It utilizes short zip line features to travel from station to station and offers guests a unique experience during a two-to three-hour tour. This gravity-based activity is designed to provide fun and exciting experiences by giving guests a unique view of NFS lands within A-Basin's SUP area. This activity would be appropriate for guests of varying age, fitness level, or familiarity with outdoor recreation and would add diversity to the range of activities offered at A-Basin.

The canopy tour would cross ski trails, forested areas, wetlands, streams, and other natural landscape features while providing expansive views of surrounding peaks. This activity would provide an adventurous yet structured and guided experience which could be an introductory activity for novice outdoor recreationalists. Additionally, the canopy tour could provide an opportunity for educational

elements concerning forest health, natural resource management, and other topics relevant to NFS lands. The canopy tour would require minimal physical exertion and participants would learn the skills required to safely use harness and braking equipment. The equipment and skills required for participation in canopy tours are similar to rock climbing, and could encourage future interest in these activities commonly found on NFS lands.

*Natural Resource-Based Recreation Opportunities Associated with Canopy Tours*

The proposed canopy tour would encourage outdoor recreation due to its location in a natural setting. This activity is dependent on a change in elevation (gravity-based) and engagement with a mountain forest setting. The design and location of the canopy tour utilizes the natural resource attributes of topography and overstory vegetation. The layout and location within forested stands would allow users to recreate in a natural setting and provide an experience reliant on these natural features. The canopy tour is based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines and activity itself replicate traditional climbing and mountaineering activities.

While on the canopy tour, guests would move in and out of the forest canopy. At the towers, guests would be slightly below the canopy and able to see the lower forest structure. In the middle of each zip line segment the rider would have an aerial view of the ski area and surrounding landscape. The experience of these activities stems from moving over/through the forest canopy, over natural topographic features. The natural topography and environment would define the adventure provided by this activity (e.g., wetland communities and stream channels). Users would have limited direct physical contact with their setting, but at the stations between zip line segments they would be standing in the forest canopy which would offer a unique perspective of the immediate and surrounding landscape.

**Challenge Course**

A challenge course is a series of activities typically constructed between elevated platforms and can have varying levels of difficulty. The challenge course would consist of both elevated and ground-based elements/obstacles using a variety of materials including trees, utility poles and steel structures. The high elements of the course would incorporate belay and safety systems using wire lines, friction devices, and climbing harnesses.

Under the Proposed Action, A-Basin would construct a challenge course along the northeast side of Black Mountain Express between a series of tree islands. The proposed challenge course would be located in stands of overstory vegetation and would also cross a ski trail, giving guests an adventurous experience with a sense of climbing in a mountain environment.

The proposed challenge course would provide an energetic and skills-based activity in a structured and semi-guided experience. The challenge course could encourage users to continue to explore the natural environment and test their skills on other NFS lands. The challenge course would require limited physical

exertion and participants would learn the skills required to safely use harness and maneuvering through an unfamiliar environment.

The challenge course would be visible to summer and winter guests on the *Ramrod* ski trail, from the Black Mountain Express chairlift, and from the base area. However, the visibility of these projects is not anticipated to detract from the recreational experience in this area because existing ski area infrastructure already dominates the landscape. Refer to Chapter 3, Section D – Scenery, for more information.

#### *Natural Resource-Based Recreation Opportunities Associated with Challenge Courses*

This activity would be located in and between tree islands surrounding the *Ramrod* ski trail and participants would be at roughly the same vertical height as the forest canopy in close proximity to trees and other natural features. There would be limited physical interaction with the environment, but like the canopy tour, this activity would provide a unique perspective in a mountain setting. Participation would be relatively structured, but participants would have the ability to stop at various locations around the course to examine or enjoy the setting. This activity has the potential to instill an awareness and appreciation of nature for guests of any age.

The activity encourages outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities. The course is based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, equipment and activity itself replicate traditional adventure, climbing and mountaineering activities. This activity could give guests the experience and confidence they need to explore similar activities elsewhere on NFS lands.

The desired experience and activity is dependent on the engagement with a mountain forest setting. The design and location of the course utilizes the natural resource attribute of vegetation (forested setting). Its layout and location adjacent to a forested stand would allow users to recreate in a natural setting and provide an experience reliant on these natural features.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of recreation extends from A-Basin's inception as a ski area in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of recreation primarily focuses on NFS lands within, and adjacent to, A-Basin's SUP area. However, the cumulative effects Analysis Area extends to include the SUP areas of all four of Summit County's ski areas (A-Basin, Copper Mountain Resort,

Keystone Resort and Breckenridge Ski Resort), all of which are administered according to the 2002 Forest Plan's Management Area 8.25 (Ski Areas – Existing and Potential).

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on recreation resources and are analyzed below:

- A-Basin MDP Update
- Keystone Resort MDP
- Copper Mountain Resort MDP
- Breckenridge Ski Resort MDP
- Breckenridge Ski Resort Summer MDP Addendum
- Breckenridge Ski Resort Peak 6 EIS
- Vail Mountain Recreation Enhancements Project EIS
- Weber Gulch Hut EA
- WRNF Forest Plan – 2002 Revision

#### ***A-Basin MDP Update***

This EIS analyzes the potential impacts of all projects in A-Basin's MDP Update except for a new snowmaking reservoir and a zip line. A new snowmaking reservoir would improve A-Basin's capacity for snowmaking, which would improve the reliability of snow conditions, thereby improving the recreational experience as well. Additionally, a zip line on the front side of the ski area would further diversify the range of multi-season recreational activities available at A-Basin. This activity would provide an accessible activity for guests to experience on NFS lands.

#### ***Projects Affecting Summit County Backcountry Terrain***

When considered cumulatively with the Proposed Action, projects contained in the MDPs of Keystone Resort, Copper Mountain Resort, and Breckenridge Ski Resort all contribute to the quality and variety of ski terrain in Summit County. However, the Proposed Action and these MDPs all contain projects that would impact the supply of backcountry terrain within existing SUP boundaries in Summit County. As analyzed in the Breckenridge Peak 6 EIS, the Peak 6 project combined with reasonably foreseeable future projects within the Copper Mountain Resort and Keystone Resort SUP areas could result in the

conversion of approximately 2,330 acres of backcountry terrain to other types of terrain.<sup>34</sup> By developing a chairlift and terrain in the Beavers, the Proposed Action would convert approximately 500 acres of backcountry terrain into developed terrain. These projects could cumulatively drive backcountry skiers into other backcountry areas throughout Summit and Clear Creek counties and/or increase backcountry skier densities in these surrounding areas.

Approved in 2014, the Weber Gulch Hut will provide access to summer and winter recreation, including backcountry ski terrain, east of Breckenridge. While the Proposed Action would reduce the area of backcountry ski terrain in Summit County, the Weber Hut would serve to improve access to backcountry terrain, thereby partially mitigating some impacts of the Proposed Action.

### *Summer Recreation Development at Ski Areas*

The Forest Service has recognized a potential opportunity for ski areas to introduce guests to outdoor recreation on NFS lands. A 2014 ROD at Vail Mountain and a 2015 ROD at Breckenridge Ski Resort approved several multi-season recreation projects, including canopy tours, a mountain coaster, hiking and mountain biking trails, challenge courses, and other multi-season activities. The Copper Mountain Resort MDP also includes a number of multi-season activities that could be analyzed and implemented in the future. When considered with the Proposed Action, these projects contribute to a diverse range of multi-season recreation opportunities in the region that will likely continue to expand in the future.

### *White River National Forest Land and Resource Management Plan – 2002 Revision*

Ongoing management of the WRNF through the Forest Plan will impact recreation across the Forest. The Proposed Action, particularly the inclusion of the Beavers into A-Basin's operational boundary, is consistent with direction provided in the Forest Plan.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Development of additional lift-served terrain in the Beavers would represent irretrievable effects to backcountry recreation resources within the SUP area. However, the vegetation and ground disturbance required to provide lift-served skiing for the Proposed Action could be reclaimed and revegetated, thus restoring its backcountry characteristics during the winter season. Therefore, this commitment of the recreation resource is not considered irreversible in nature.

---

<sup>34</sup> USDA Forest Service, 2012

## B. SOCIAL AND ECONOMIC RESOURCES

### SCOPE OF THE ANALYSIS

The additional winter facilities proposed and the development of multi-season recreation activities at A-Basin have the potential to affect not only the physical environment but also the social and economic (socioeconomic) environment. A correlation exists between public use of NFS lands and the economies and societies of adjacent communities. This correlation encompasses many factors such as employment, schools, use of public/social services, and workforce housing in Summit County, which are assessed and disclosed herein. The Analysis Area for the project is defined as Summit County, Colorado.

### AFFECTED ENVIRONMENT

#### A-Basin Employment

As is true for most ski areas and mountain resorts, A-Basin employs more workers in the winter than in the summer. A-Basin currently employs approximately 345 workers (198 full-time employees and 147 part-time employees) in the winter and approximately 30 workers (13 full time employees and 17 part-time employees) in the summer.

**Table 3B-1:  
A-Basin Baseline Employment**

Employment Type	Full-Time	Part-Time
Year-Round Employment	55	N/A
Winter Seasonal Employment	198	147
Summer Seasonal Employment	13	17

#### A-Basin Workforce Housing

In 2013 Summit County prepared a Workforce Housing Needs Assessment outlining needs based on market and demographic changes in Summit County.<sup>35</sup> The report stresses the importance of housing—more specifically, affordable housing—within the communities of Summit County.

The 2013 Summit County Workforce Housing Needs Assessment assessed the impact of affordability, seasonal workers fluctuation, rental market, and type and location of available housing options. The report concludes that housing affordability remains a problem in Summit County and recommends nine strategies including making transactions for deed restricted homes easier, preserving free market units occupied by employees, and creating a housing rehabilitation program for rundown housing units.

---

<sup>35</sup> Rees Consulting, 2013

The majority of A-Basin employees live in non-employee housing throughout Summit County, which impacts the affordability and availability of housing for both resort and non-resort employees living in Summit County.

While Summit County as a whole faces severe housing challenges, the majority of A-Basin's employees live in the Lower Blue Basin (Silverthorne) and the Snake River Basin (Dillon Valley, Summit Cove, Keystone areas), which do not reflect affordable housing scarcity issues to the magnitude seen in the rest of the County.<sup>36</sup> The Summit County Workforce Housing Needs Assessment found that the Lower Blue Basin had the largest inventory of apartments for low income, year-round employees when compared to the rest of the County.<sup>37</sup> Additionally, the Lower Blue Basin had more employees than jobs, making it a net exporter of workers.<sup>38</sup> The Town of Silverthorne is currently constructing a workforce housing neighborhood known as Smith Ranch, which will incrementally provide between 80 and 130 units over the next five years, adding increased diversity to the types of homes that are available to the workforce (i.e., single family homes, duplex homes, and townhomes).<sup>39</sup>

The need for additional workforce housing in the Snake River Basin is lower than any other area of Summit County as a large amount of restricted workforce units already exist in this area. Survey data shows that while 26 percent of the County's employees currently live in the Snake River Basin, only 16 percent of employee households want to live in the Snake River Basin, limiting the opportunities for new development.<sup>40</sup> Like the Lower Blue Basin, the Snake River Basin is also a net exporter of workers.

Characteristics of the housing stock in Summit County are shown in Table 3B-2. Summit County is a popular second home market, reflected in the number of vacant housing units shown in Table 3B-2. These homes contribute to driving up the price of housing in the area. Table 3B-2 also indicates that housing in Summit County has not reached capacity; however, a countywide strategic plan to increase the density of affordable workforce housing is being developed to match population growth trends of the area.<sup>41</sup>

---

<sup>36</sup> Henceroth, 2015a; Rees Consulting, 2013

<sup>37</sup> Rees Consulting, 2013

<sup>38</sup> Ibid.

<sup>39</sup> Ibid.

<sup>40</sup> Ibid.

<sup>41</sup> Colorado Department of Local Affairs – State Demography Office, 2014

**Table 3B-2:  
Population and Housing Units in Summit County 2015**

<b>Town</b>	<b>Total Population</b>	<b>Total Housing Units</b>	<b>Household Population</b>	<b>Persons Per Household</b>	<b>Occupied Housing Units</b>	<b>Vacant Housing Units</b>
Blue River	857	726	857	2.53	339	387
Breckenridge	4,763	7,187	4,660	2.28	2,044	5,143
Dillon	914	1,291	914	1.99	460	831
Frisco	2,753	3,167	2,753	2.07	1,332	1,835
Montezuma	67	56	67	2.58	26	30
Silverthorne	4,010	2,105	4,008	2.68	1,497	608
Unincorporated Area	15,273	15,742	15,105	2.39	6,330	9,412
<b>SUMMIT COUNTY TOTAL</b>	<b>28,637</b>	<b>30,274</b>	<b>28,364</b>	<b>2.36</b>	<b>12,028</b>	<b>18,246</b>

*Source:* Colorado Department of Local Affairs- State Demography Office, 2015

In addition to general workforce housing available in Summit County, A-Basin maintains housing through the ownership of twenty-eight beds (twenty-seven in Tenderfoot at Keystone, and one in the base area of A-Basin) for employee housing. Every year A-Basin also rents beds throughout the County to meet the demand of their employment needs. For the 2015/16 ski season, A-Basin is renting an additional thirteen beds to meet anticipated employment needs, whereas last season only six beds were rented.<sup>42</sup> A-Basin will continue to meet the housing needs of their employees by renting the appropriate number of units/beds on an annual basis.

### **Social Services**

Between 2000 and 2010 the population in Summit County grew by 8.4 percent, and population projections anticipate growth in Summit County to range between 1 and 3 percent annually into 2040.<sup>43</sup> As population increases so does the demand for the social services that are available within Summit County. Social services include public health services, family services, child care options, and other services provided by Summit County and non-profits within the County.

Social services such as the Summit County Community Care Clinic and food assistance programs provide services to individuals living in the community who cannot afford health insurance and/or sufficient food to maintain a healthy and comfortable lifestyle. In the fall of 2015 search and rescue, food assistance programs, the Community Care Clinic, Summit Stage, Early Childhood Options, and emergency services were contacted to better understand the demand for their services before heading into the winter season, which many service providers noted to be their busiest season. Like others in the community, Summit County Community Care Clinic and the food assistance programs have paid close attention to those they serve and now make adjustments to accommodate for seasonal fluctuation.

---

<sup>42</sup> Henceroth, 2015a

<sup>43</sup> Colorado Department of Local Affairs – State Demography Office, 2014

The Summit County Community Care Clinic hires additional staff during the winter months in order to meet the heightened demand that accompanies the influx of workers for the winter season. Additionally, plans to relocate certain offices are in place in order to increase the capacity of both the Community Care Clinic's medical and dental offerings. Dillon and Silverthorne make up two of the County's top three towns in terms of patients served by the Summit County Community Care Clinic, indicating that some A-Basin employees will likely be affected by the changes to accommodate a greater number of patients.

Summit Stage is another social service that sees the majority of their demand in the winter months. During this time, ridership is at almost double that of the summer, with the busiest lines running from Breckenridge to Frisco and Breckenridge to Silverthorne.<sup>44</sup> Despite a large amount of riders served, communication with Summit Stage indicated that they were not anywhere near capacity and could take on increased demand by local riders. A recent survey showed that ridership is distributed primarily between year-round residents (38 percent) and visitors/tourists (35 percent), with seasonal residents accounting for almost all of the remaining ridership (21 percent).<sup>45</sup> According to Summit Stage, additional ridership by employees could be handled, and currently only 20 percent of total riders on a given day are using the transit system to commute to work.<sup>46</sup>

In contrast, the food assistance program experiences an increase in demand right before winter when seasonal workers have moved to the County but have not yet received paychecks for their work. October and November recorded significantly higher visits than any other month, which the program attributes to an influx of seasonal resort employees.<sup>47</sup> The demand for food assistance programs has been steadily rising throughout all months of the year, which is attributable to an increase in ski resort employees in the County year after year. Often times resort employees work part time or do not receive benefits, which can result in a need for these services.<sup>48</sup> While demand is considerably higher in Breckenridge than Dillon or Silverthorne, countywide expansions such as the mobile food pantry have been implemented to help meet the heightened need for the programs services in recent years.<sup>49</sup>

Child care options available in Summit County are somewhat different than other social services, as there is an element of preference associated with the demand for these services. While Early Childhood Options noted that child care services throughout the County are not at capacity, there is always a demand for increased offerings to meet the varying preferences of parents utilizing these services.<sup>50</sup> Some parents choose to send their child to a home-based care provider, while other parents enroll their children at the various centers throughout the County. In either case, demand is constantly fluctuating and efforts are currently being made to best meet the needs of the County, especially in options available for children

---

<sup>44</sup> Andrews, 2015

<sup>45</sup> Brosius, 2015

<sup>46</sup> Ibid.

<sup>47</sup> Rumrill, 2015

<sup>48</sup> Ibid.

<sup>49</sup> Ibid.

<sup>50</sup> Mailman, 2015

under the age of 3, which are, and will continue to be, in highest demand. Children under the age of 3 require more supervision, limiting the number of children a licensed professional can care for as supervision ratios require more staffing for children of this age.<sup>51</sup>

In addition to ski patrol's initial response to emergencies occurring at or near the ski area, County emergency services are sometimes called upon for assistance. Since the 2007/08 season, A-Basin has seen approximately seventy ambulance visits and two helicopter evacuations per season.<sup>52</sup> Additionally, Summit County Rescue Group (SCRG) noted that they have responded to an average of less than five rescue calls each winter season from the backcountry area accessed from A-Basin's operational boundary. SCRG also noted that they would continue to have capacity to respond to these calls.<sup>53</sup>

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

Under the No Action Alternative, A-Basin would continue to employ 30 employees (13 full time employees) in the summer, 345 employees (198 full time employees) in the winter, and 55 full time year-round employees. The demand for workforce housing and social services would see no increase outside of natural trends.

### **Alternative 2 – Proposed Action**

#### **A-Basin Employment**

The projects included in Alternative 2 would result in increased employment at A-Basin, as indicated in the Table 3B-3.

**Table 3B-3:**  
**A-Basin New Employment – Alternative 2**

<b>Employment Type</b>	<b>Full-Time</b>	<b>Part-Time</b>
Year-Round Employment	21	N/A
Winter Seasonal Employment	19	N/A
Summer Seasonal Employment	3	N/A

Winter projects in Alternative 2 would require approximately thirteen new ski patrollers and six new lift operators (considering that two operators would become available once the Norway chairlift is removed). Four of these operators would be for the Beavers chairlift and two of the operators would be for the Zuma Access surface lift). One additional grooming operator would be needed for the expanded winter season offerings.

---

<sup>51</sup> Ibid.

<sup>52</sup> Henceroth, 2015b

<sup>53</sup> Summit County Rescue Group, 2015

Expanded summer operations would require three new employees to operate the Black Mountain Express chairlift, which would serve the canopy tour and challenge course. In past years, the Black Mountain Express has not run consistently during the summer season—only for weddings and other special events.

All other multi-season recreation projects are accounted for in the addition of twenty-one year-round employees, as the canopy tour, challenge course, lift maintenance, and guest services needs would require additional employees virtually year-round. However, these year-round employees would not necessarily increase the population of Summit County. In most cases, the additional workforce needs of the proposed projects could be filled by current seasonal employees taking on another season of work. The canopy tour and challenge course would require eleven and seven new employees, respectively. The addition of one new employee would be needed to meet year-round lift maintenance needs and three year-round employees would be needed to meet the additional guest services/infrastructure needs.

These new employees could generate additional indirect employment in the surrounding area (including servers at local restaurants, for example), but at the scale of the Summit County economy these impacts would be negligible.

#### *A-Basin Workforce Housing*

As discussed above, the Proposed Action would add approximately forty-three employees to A-Basin's workforce throughout the year. While housing availability in Summit County is an ongoing issue, the Proposed Action is not anticipated to measurably affect the housing market in Summit County. The majority of workers are anticipated to already be living in the area, and A-Basin would readily purchase additional employee housing units to meet the demand of their workforce.<sup>54</sup> As mentioned above A-Basin maintains ownership of twenty-eight employee housing units, but would acquire additional units throughout the County on a yearly basis to meet the needs of their employees.<sup>55</sup> Overall, the new additions to A-Basin's workforce would have a negligible impact on the workforce housing available in Summit County given current trends in housing stock and population growth.

#### *Social Services*

Communication with social service providers in the area indicates that social services in Summit County are currently being used and would continue to be used by some A-Basin employees and visitors of the ski area. As documented in the Affected Environment section, resort and resort industry-related employees around the County are responsible for generating a significant portion of the demand for these services. Many social service providers have researched trends in demand and now make adjustments to better meet the needs of the County.

Social service providers in the County recognize that much of their highest demand stems from the seasonal fluctuation of resort employees. During these times, the Summit County Community Care Clinic

---

<sup>54</sup> Henceroth, 2015a

<sup>55</sup> Ibid.

hires more employees to handle the higher capacity of those needing care. The Summit County Community Care Clinic is not alone, as others also noted changes that are made to accommodate for seasonal fluctuations in demand. None of the social services contacted indicated that they had reached capacity, as noted in the Affected Environment section.

While the addition of approximately forty-three employees to A-Basin's workforce has the potential to affect the availability of social services in Summit County to both A-Basin employees and non-employees alike, communication with search and rescue, food assistance programs, the Community Care Clinic, Summit Stage, Early Childhood Options and emergency response units shows that this would not measurably affect the availability of social services within the County.<sup>56</sup> It is possible that the new employees at A-Basin resulting from the proposed projects would utilize social services such as the Community Care Clinic, food assistance programs, etc. However, when considered in the context of population and employment trends across Summit County, the impacts from the new employees at A-Basin would be negligible and would not cause these social services to exceed their capacity.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of social and economic resources extends from A-Basin's inception as a ski area in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of social and economic resources are limited to Summit County, CO. There is a heightened emphasis on the Snake River and Lower Blue River Basins of the County, as the majority of A-Basin employees live in this area.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area and County development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on social and economic resources and are analyzed below:

- A-Basin MDP Update
- Keystone Resort MDP

---

<sup>56</sup> Andrews, 2015; Mailman, 2015; Rumrill, 2015; Summit County Rescue Group, 2015; Vaine, 2015

- Copper Mountain Resort MDP
- Breckenridge Ski Resort MDP
- Breckenridge Ski Resort Summer MDP Addendum
- Breckenridge Ski Resort Peak 6 EIS
- Continued Build-out of Summit County
- Continued Build-out of Snake River Basin
- Residential Developments in the Lower Blue River Basin
- WRNF Forest Plan – 2002 Revision

Forest Service decisions within the SUP boundaries of the resorts listed above, in addition to private land developments throughout Summit County, have contributed to economic growth trends over the past few decades. As discussed in the Affected Environment section, A-Basin has contributed to these trends by creating jobs and employing people in Summit County.

An estimate of economic impacts has been prepared based on the additional employment needs that would occur at A-Basin due to projects associated with the Proposed Action. As a result, Summit County could see an increased demand for workforce housing and social services in Summit County. However, as conveyed in the Summit County Workforce Housing Needs Assessment and through communication with social service providers of the County, the increased demand for these offerings is not a result of new employment opportunities at A-Basin, but is rather an ongoing trend perpetuated well beyond any one aspect of the County that must continue to be accounted for when analyzing the impacts of new projects.<sup>57</sup> While it is noted that A-Basin employees currently use, and will continue to use, workforce housing and social services provided by Summit County, it is understood that the increases in employment at A-Basin would not cumulatively affect social and economic aspects of the County more than a negligible amount.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

No irreversible and/or irretrievable commitment of social and economic resources has been identified in association with either alternative analyzed in this document.

---

<sup>57</sup> Rees Consulting, 2013; Andrews, 2015; Mailman, 2015; Rumrill, 2015; Summit County Rescue Group, 2015; Vaine, 2015

## C. SKI AREA ACCESS AND PUBLIC SAFETY

### SCOPE OF THE ANALYSIS

The scope of this analysis is limited to the sections of Highway 6 and I-70 between exit 216 at Loveland Pass and exit 205 at the Town of Silverthorne. This section describes the access routes to A-Basin and the existing state of traffic, parking, and pedestrian access at the ski area. It is recognized that some guests do arrive at the ski area via alternative modes of transportation, whether by charter bus/van, public transportation, or in carpools. Additionally, a portion of A-Basin's employees arrive via public transportation and carpooling. This traffic analysis calculates existing and projected traffic volumes from the existing and proposed CCC on the premise that all A-Basin guests arrive via personal transportation rather than by public transportation, and, therefore, presents the most conservative scenario.<sup>58</sup>

### AFFECTED ENVIRONMENT

#### Ski Area Access

A-Basin is accessed via Highway 6, which travels through and separates A-Basin's base area facilities and Early Riser parking lot from additional parking areas on the north side of the highway. A-Basin is approximately 1.5 to 2 hours driving time from Denver and the Front Range metropolitan area via I-70 and Highway 6, either through Eisenhower Tunnel or over Loveland Pass, respectively (refer to the Vicinity Map). Eastbound access to the ski area occurs via Highway 6 and travels past Keystone Resort. Westbound traffic would depart from I-70 at exit 216 and proceed over Loveland Pass.

Highway 6 is a year-round, two- and four-lane highway. Although it is a year-round highway, it can be temporarily closed on Loveland Pass during adverse winter weather conditions. Highway 6 between I-70 and A-Basin is kept open year-round, with the Colorado Department of Transportation (CDOT) taking responsibility for highway snow removal, sanding, and the snow safety/avalanche control programs associated with Loveland Pass. At its intersection with A-Basin, Highway 6 has no auxiliary lanes for access to any of A-Basin's parking lots.

A-Basin management estimates that 60 percent of its clientele is composed of skiers traveling from the east over Loveland Pass on Highway 6 and the remaining 40 percent traveling from the west on Highway 6 through Keystone.

#### *Winter Traffic*

CDOT records traffic volumes on state highways and Colorado interstate highway systems. Average Daily Traffic (ADT) is the number of vehicles passing a count location in both directions in a 24-hour period. Raw ADT data is processed and converted to Average Annual Daily Traffic (AADT) volumes, defined as the total volume of traffic on a road segment for one year, divided by 365 days. Both directions

---

<sup>58</sup> For additional information on CCC, refer to Chapter 3, Section A – Recreation.

of traffic volumes are reported. AADT can be adjusted to compensate for monthly and daily fluctuations in traffic—the basic intent being to provide traffic volumes which best approximate the use of a given highway section for a typical day of the year. Proximate and most relevant to A-Basin, currently CDOT only records and reports traffic count information east of the Montezuma Road exit on Highway 6 east of Keystone Resort. At this location, Highway 6 has an AADT of 1,300.

Assuming that approximately 60 percent of A-Basin's guests travel to and from the ski area via Loveland Pass, A-Basin guest capacity generates an average of approximately 825 vehicles to the roadway and 1,650 vehicle trips per day throughout the ski area's winter operating season on Highway 6 east of the ski area.<sup>59</sup> The remaining 40 percent of guests would travel from the west on Highway 6, contributing 550 vehicles to the roadway and 1,100 vehicle trips per day throughout the ski area's winter operating season. It is important to note A-Basin is not operating at CCC every day of winter operation. CCC is generally comparable to the tenth busiest day of the ski season.

### *Summer Traffic*

A-Basin currently has no measureable effect on summer traffic, as summer recreation activities are a minimal part of the area's existing operations. Traffic in the summer months (typically June through September) is generally less than winter traffic volumes.

### *Parking*

There are currently four free parking lot areas (Early Riser, High Noon, Last Chance, and the overflow lots) and one fee-based parking lot (Administration Lot) at A-Basin. The Administration Lot is located directly outside the Guest Services Building and Ticket/Season Pass Office adjacent to the base area. The Early Riser lot is located adjacent to the mountain on the south side of Highway 6, while the High Noon, and Last Chance parking lots are located approximately one-quarter mile past the base area towards Loveland Pass.

A pedestrian tunnel exists for guests to safely cross Highway 6 from the upper lots, and is accessed from the west side the High Noon Lot. A-Basin also offers shuttle services to the base area from the upper parking lots. Despite the pedestrian tunnel, shuttles, and warning signage stating crossing the highway is not permitted, some guests choose to cross the highway on their own when parking at the lots located further away from the tunnel.

Occasionally, overflow parking occurs along the sides of Highway 6 in shoulder lots. Shuttle services to the base area from these lots is provided by A-Basin. Guests would not have to cross the highway at any point from these areas.

---

<sup>59</sup> Based on calculation of CCC x 0.6/2.75 = 824.75.

Table 3C-1 details the parking capacities of each lot.

**Table 3C-1:  
Existing Parking Capacities**

Parking Lot	Vehicle Capacity
Early Riser	575
High Noon	700
Last Chance	400
Overflow lots	160
Administration Lot	75
<b>TOTAL</b>	<b>1,910</b>

As shown in Table 3C-1, A-Basin's current parking capacity totals 1,910 vehicles, which is sufficient parking capacity during days at the existing CCC. Peak days typically occur at A-Basin during the winter holidays, and in late spring when other ski areas in the area have closed for the season and the ski area receives new snowfall. On these days, once all the lots are at capacity, guests park at Keystone Resort and utilize shuttle transportation to and from the ski area.

Current guest parking during summer months is not tracked but there is no deficit in parking.

### **Public Safety**

Amongst the advanced and expert skiers, currently totaling 53 percent of A-Basin's guest population, there is a strong interest in skiing the Beavers Bowl, Steep Gullies, and Rock Pile areas. According to Thompson (2014), an estimated 13,290 skiers descended the greater Beavers Bowl terrain in the 2013/14 season during the approximate 165-day backcountry season (an average of 80 skiers per day). As this terrain depends heavily on snow conditions, these estimates do fluctuate.

Depending on the selected descent route—the Rock Pile or south section of Beaver Bowl, main Beaver Bowl or the Steep Gullies—skiers have two options to return to the base area. Skiers descending the Steep Gullies may take an early traverse back to the Pallavicini chairlift's bottom terminal. This route requires a few minutes of hiking or intensive skating. The majority of skiers ski the entire length of the Beavers, Steep Gullies or the Rock Pile and hike up to Highway 6 to hitchhike back to the A-Basin base area. A conservative estimate that 70 percent of these skiers would choose to hitchhike back to A-Basin, would result in approximately 9,300 skiers hitchhiking on Highway 6 per season. In a 165-day backcountry season, this averages to approximately 56 guests per day. This volume of skiers/hitchhikers combined with Highway 6 traffic is a safety hazard for A-Basin guests.

Those skiing the Beavers are spending a minimum of one hour in transit outside of A-Basin's operational boundary, from the start of their descent until their return to the base area. During this time guests are exposed to dangers that are not typical of a resort skiing experience. Longer emergency response times,

backcountry conditions, and proximity to highway traffic are all safety hazards that characterize the current experience of skiing the Beavers.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

#### *Ski Area Access*

Front Range guests would continue to access A-Basin via Highway 6 over Loveland Pass or I-70 through Eisenhower Tunnel, connecting to Highway 6 in Silverthorne. Local guests would access the ski area via Highway 6 through Keystone. A-Basin would be expected to remain similar to existing conditions and visitation increases would continue over the next ten plus years based on anticipated state-wide, regional, and local population growth trends.

#### Winter and Summer Traffic

No additional terrain or summer activities would be offered; therefore, A-Basin's CCC would remain the same. Natural increases in visitation would likely cause A-Basin to operate closer to or at their CCC for a greater number of days throughout the season. However, there would no changes in traffic volume attributable to the recreation opportunities offered at A-Basin.

#### Parking

The current parking capacity at A-Basin is 1,910. Sufficient parking would continue to be available.

#### *Public Safety*

Under the No Action Alternative, the Beavers terrain would not become part of A-Basin's operational boundary. Guests who decide to ski this terrain would do so at their own risk and would likely continue to hitchhike back to A-Basin's base area, as designated egress and hike-back routes would not be provided. The area would continue to exist as backcountry terrain with the existing safety hazards as discussed in the recreation section.

### **Alternative 2 – Proposed Action**

#### *Ski Area Access*

None of the proposed projects would affect the existing access to the ski area. Access would be identical to the No Action Alternative.

#### Winter Traffic

Under Alternative 2, the proposed projects would increase A-Basin's CCC from 3,780 to 4,140 (an additional 360 guests or 9.5 percent). Assuming that approximately 60 percent of A-Basin's guests travel to and from the ski area via Loveland Pass, Alternative 2 would generate an additional 79 vehicles on the roadway and 158 vehicle trips per day throughout the ski area's winter operating season on Highway 6 east of the ski area. The remaining 40 percent of guests would travel from the west on Highway 6,

contributing an additional 52 vehicles on the roadway and 104 vehicle trips per day throughout the ski area's winter operating season on throughout the ski area's winter operating season.

### **Summer Traffic**

Under the Proposed Action, traffic levels are not expected to increase due to the proposed additions. The amenities proposed would not increase the traffic volume but instead, primarily draw visitation from passing traffic.

### **Parking**

Under the proposed action, the CCC at A-Basin would increase from 3,780 to 4,140. As stated in the Affected Environment, A-Basin maintains 1,910 parking spaces. At a CCC of 4,140 guests, A-Basin would need to accommodate 1,505 vehicles. Therefore, the existing parking would be sufficient on the CCC or tenth busiest day. On peak days during the spring, A-Basin would continue to utilize the Keystone Resort parking lot through an agreement with Vail Resorts.

### ***Public Safety***

The incorporation of the Beavers terrain into A-Basin's operational boundary would greatly increase public safety along Highway 6. As mentioned in the Affected Environment section, it is estimated that 9,305 A-Basin guests hitchhike back to the base area from this terrain in a given season. The Proposed Action would provide lift-served skiing throughout the area along with designated egress and hike-back routes that would facilitate skiers' return to the Pallavicini chairlift.

By providing routes back to lift-served skiing and incorporating the Beavers terrain into A-Basin's operational boundary, the need for guests to hitchhike as previously associated with skiing this area is removed. However, it is expected that the Rock Pile would see more skier traffic as it would be even closer to lift-served terrain which would result in hitchhikers congregating around the runaway truck ramp following their descent of this area. Despite greater use in the Rock Pile area it is still expected that the inclusion of the Beavers would decrease the overall number of guests entering A-Basin's adjacent backcountry who then hike or hitchhike along Highway 6 to return to the ski area. By reducing the volume of guests hiking and hitchhiking along Highway 6, the safety of motorists and A-Basin visitors alike is expected to increase. Additionally, the inclusion of egress routes and a lift-served terrain network would have a positive effect on the recreational experience of A-Basin guests, which is discussed at greater length in Chapter 3, Section A – Recreation.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of ski area access and public safety extends from A-Basin's inception as a ski area in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of ski area access and public safety are limited to roadways and surrounding backcountry in the vicinity of A-Basin's SUP area. This Analysis Area is limited to the sections of Highway 6 and I-70 between exit 216 at Loveland Pass and exit 205 at the Town of Silverthorne.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects analysis area, the reader is referred to Appendix A in the document. Past ski area development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on ski area access and public safety and are analyzed below:

- A-Basin MDP Update
- Keystone Resort MDP
- Continued Build-out of Summit County
- Continued Build-out of Snake River Basin
- Residential Developments in the Lower Blue River Basin
- I-70 Mountain Corridor PPSL
- Loveland Pass Gazex Avalanche Mitigation System

This DEIS analyzes the potential impacts of all projects in A-Basin's MDP Update except for a new snowmaking reservoir and a zip line. Cumulatively, it is anticipated that these projects would increase A-Basin's CCC, resulting in increased travel on the roadways which provide the public with access to the ski area. Keystone Resort's MDP is also considered in this same context as it is located in close proximity to A-Basin on Highway 6. Developments associated with Keystone Resort's MDP are also anticipated to increase traffic volumes on many of the same roads used by the public to access A-Basin.

Continued build-out and residential developments in Summit County, the Snake River Basin, and the Lower Blue River Basin indicate that population is increasing in the areas surrounding A-Basin. This population growth, combined with the proposed projects, could result in an increased strain on roadways in the area.

Both the I-70 Mountain Corridor PPSL and Loveland Pass Gazex Avalanche Mitigation system are anticipated to positively affect traffic on the sections of road discussed in this analysis. The I-70 Mountain Corridor PPSL uses a floating toll system to alleviate traffic in a portion of heavily traveled Eastbound I-70 by creating a Mountain Express toll lane that will only open during peak travel periods and operates as a third lane. The Loveland Pass Gazex Avalanche Mitigation system will utilize remote detonators in hopes of better controlling avalanches and reducing the chance of lengthy road closure. The effects of these projects have not been realized yet but it is anticipated that they will cumulatively benefit ski area access and public safety in the future.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

No irreversible and/or irretrievable commitments of resources in relation to ski area access and public safety have been identified in association with either alternative analyzed in this document.

## **D. SCENERY**

### **SCOPE OF THE ANALYSIS**

Analysis of the aesthetic environment requires an evaluation of the Analysis Area and its ability to absorb the effects of both historic and ongoing human-induced and natural changes. Slope, natural vegetation types and patterns, topography, and viewing distance are important factors in this analysis. A-Basin, over the past seven decades of operation, has developed chairlift and trail networks, guest service facilities, and other infrastructure on NFS lands to enhance the visitor's recreational experience within the SUP area.

This scenery analysis focuses on A-Basin's existing infrastructure and proposed projects within its SUP area as visible from identified critical viewpoints.

The four critical viewpoints listed below include views from both the immediate foreground/foreground (from viewer to 0.5 mile out) and middleground viewpoints (0.5 mile to 4 miles). Visual simulations were developed from each viewpoint to represent the possible visibility of proposed projects (refer to Figures 3–10). The location of each of these critical viewpoints is identified on these figures.

- *Critical Viewpoint 1 – Highway 6 (Lower):* This viewpoint is located on Highway 6 approximately 1 mile west of the entrance to the Early Riser parking lot. This location was selected as a critical viewpoint because viewers at this location will see the Project Area (specifically the Beavers area) in the middleground from a primary travelway. Also, this location represents a travelway containing a relatively high number of viewers, including motorists

travelling between Summit County and A-Basin as well as continuing over Loveland Pass. The view direction simulated from this location looks directly at the Project Area to best represent the change in the landscape that would be perceived by viewers in this location.

- *Critical Viewpoint 2 – Highway 6 (Upper)*: This viewpoint is located on Highway 6 approximately 1 mile east of the entrance to the A-Basin parking lot. This location was selected as a critical viewpoint because viewers at this location will see the Project Area (particularly the front side of the ski area) in the middleground from a primary travelway. Similar to Critical Viewpoint 1, vehicle traffic over Loveland Pass results in a high number of viewers at this location. The view direction simulated from this location looks directly at the Project Area to best represent the change in the landscape that would be perceived by viewers in this location.
- *Critical Viewpoint 3 – Upper Chisholm*: This viewpoint is located within the developed ski trail network near the Black Mountain Lodge, on the *Chisholm* ski trail. This location was selected as a critical viewpoint because viewers at this location will see the Project Area (particularly the proposed canopy tour) in the immediate foreground. The view direction simulated from this location looks directly at the Project Area to best represent the change in the landscape that would be perceived by viewers in this location.
- *Critical Viewpoint 4 – Base Area*: This viewpoint is located in the base area. This location was selected as a critical viewpoint because viewers at this location will see the Project Area (particularly the front side of the ski area) in the immediate foreground and foreground. While located within the developed ski area, there are a large number of viewers at this location. The view direction simulated from this location looks directly at the Project Area to best represent the change in the landscape that would be perceived by viewers in this location.

## FOREST SERVICE SCENERY MANAGEMENT SYSTEM

The Scenery Management System (SMS) was adopted in 1995 as the primary scenery management direction by the Forest Service. The SMS is a systematic approach for assessing scenic resources in a Project Area and developing findings to help make management decisions on projects. The system is founded on an ecological aesthetic, which recognizes that management which preserves the integrity, stability, and beauty of the biotic community and preserves the scenery, as well.

### **Scenic Integrity and Landscape Character**

Scenic integrity is a measure of the degree to which a landscape is visually perceived to be complete, indicating the degree of intactness and wholeness of the landscape character. An action can cause scenic resource change that can be objectively measured. By assessing the existing scenic character of an area in terms of pattern elements (form, line, color and texture) and pattern character (dominance, scale diversity and continuity), it is possible to identify the extent to which the scenic character of a facility would exhibit scenic contrast with the landscape, or its converse, scenery compatibility.

In 2002 the WRNF documented and disclosed the “existing scenic integrity” of all lands on the Forest in the Forest Plan FEIS.<sup>60</sup> The existing scenic integrity of the Project Area is discussed below. These classifications were field verified for this DEIS.

The 2002 Forest Plan establishes acceptable limits of change for Scenic Resources.<sup>61</sup> The limits of acceptable change of a particular area (e.g., Forest Plan Management Area) are the documented SIO, which serve as a management goal for scenic resources for that area. SIO provide a measure of visible disruption of landscape character and help locate and rank areas in need of scenic rehabilitation.

SIO range from *Very High* (unaltered environment) to *Unacceptably Low* (extremely altered environment). As indicated in the 2002 Forest Plan, the SIO for A-Basin’s SUP area is *Low* and *Very Low*. The *Low* SIO refers to landscapes where the valued landscape character “appears moderately altered.” The *Low* SIO is defined as:<sup>62</sup>

*Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.*

The *Very Low* SIO refers to landscapes where the valued landscape character “appears heavily altered.” The *Very Low* SIO is defined as:<sup>63</sup>

*Deviations may strongly dominate the valued landscape character. They may borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, changes in vegetation types, or architectural styles outside the landscape being viewed. However, deviations must be shaped by and blend with the natural terrain so that elements such as unnatural edges, roads, landings and structures do not dominate the composition.*

The 2002 Forest Plan states that all NFS lands shall be managed to attain the highest possible scenic quality commensurate with other appropriate public uses, costs, and benefits.<sup>64</sup>

### **SMS Distance Zones**

Viewing distance is important in determining how change is perceived across a landscape. Distance zones are divisions of a particular landscape being viewed, and are used to describe the part of a characteristic landscape that is being inventoried or evaluated.

---

<sup>60</sup> USDA Forest Service, 2002b

<sup>61</sup> USDA Forest Service, 2002a

<sup>62</sup> USDA Forest Service, 1995

<sup>63</sup> Ibid.

<sup>64</sup> USDA Forest Service, 2002a

- Immediate Foreground: This zone begins at the viewer and extends to about 300 feet. Individual leaves, flowers, twigs, bark texture, and other details dominate this view.
- Foreground: This zone is usually limited to areas within 300 feet to 0.5 mile (not to exceed 0.5 mile) of the observer, but it must be determined on a case-by-case basis, as should any distance zoning. Generally, detail of landforms is more pronounced when viewed from within the foreground zone.
- Middleground: Alterations in the middleground (0.5 to 4 miles from the observer) are less distinctive. Texture is normally characterized by the masses of trees in stands or uniform tree cover.
- Background: This zone extends from middleground (minimum of 4 miles between the observer and the area being viewed) to infinity. Shape may remain evident beyond 10 miles, especially if it is inconsistent with other landscape forms. Beyond 10 miles, alteration in landscape character becomes obscure.

### **Forest Plan Standards and Guidelines**

In addition to the SMS, the 2002 Forest Plan contains forest-wide standards and guidelines which apply to resources across the WRNF.<sup>65</sup> While the 2002 Forest Plan contains no forest-wide standards for scenery management, it offers the following guidelines that are applicable to this project:<sup>66</sup>

- Management activities should be designed and implemented to achieve, at minimum, the level of scenic integrity shown on the SIO Map.
- Plan, design and locate vegetation manipulation on a scale that retains the color and texture of the landscape character, borrowing directional emphasis of form and line from natural features.
- Choose facility and structure design, scale, color of materials, location and orientation to meet the scenic integrity objective on the SIO Map.  
Facilities, structures and towers with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.

Management Area 8.25 standards and guidelines applicable to this project and the scenery resource include:

- Standard: Permanent outdoor advertising is not a needed public service and is not allowed.

---

<sup>65</sup> A *standard* is a course of action which must be followed; **adherence is mandatory**. A *guideline* is a preferred course of action designed to achieve a goal, respond to variable site conditions, or respond to an overall condition.

<sup>66</sup> USDA Forest Service, 2002a

- Guideline: Facilities are designed with an architectural theme intended to blend facilities with the natural environment.
- Guideline: Vegetation is retained to screen facilities from key viewpoints.
- Guideline: Roads are designed to minimize visual and resource impacts. They are constructed and maintained with good alignments and grades that minimize erosion.

Furthermore, the following information on the desired condition for scenic values is contained in Management Area 8.25:<sup>67</sup>

*Protection of scenic values is emphasized through application of basic landscape aesthetics and design principles, integrated with forest management and development objectives. Reasonable efforts are made to limit the visibility of structures, ski lifts, roads, utilities, buildings, signs, and other man-made facilities by locating them behind landform features or by screening them behind existing vegetation. Facilities are architecturally designed to blend and harmonize with the national forest setting as seen from key viewpoints. Facilities that no longer serve a useful purpose are removed.*

The 2002 Forest Plan further states that it is a regional goal to “provide for scenic quality and a range of recreational opportunities that respond to the needs of the forest customers and local communities.”<sup>68</sup>

### **Forest Service Manual**

On April 17, 2014, the Forest Service released its Final Directives for Additional Seasonal and Year-Round Recreation Activities at Ski Areas. FSM 2343.14 includes this final direction and criteria to help authorized officers determine whether proposals for these activities are consistent with SAROE. FSM 2343.14(1) includes criteria for evaluating additional seasonal and year-round recreation activities and associated facilities that may be authorized at ski areas. This guidance includes criteria specific to the visual impact of proposed activities and associated facilities. Activities and associated facilities must, to the extent practicable, harmonize with the natural environment of the site where they would be located by:

- Being visually consistent with or subordinate to the ski area’s existing facilities, vegetation and landscape; and
- Not requiring significant modifications to topography to facilitate construction or operations.

This analysis includes a specific discussion of the proposed canopy tour and challenge course in relation to these criteria. Refer to Appendix C for additional information.

---

<sup>67</sup> Ibid.

<sup>68</sup> Ibid.

## **The Built Environment Image Guide**

The BEIG is a manual for the “thoughtful design and management” of the built environment contained within the National Forests by province.<sup>69</sup> The Forest Service defines the built environment as “the administrative and recreation buildings, landscape structures, site furnishings, structures on roads and trails, and signs installed or operated by the Forest Service, its cooperators, and permittees.”<sup>70</sup> The BEIG divides the U.S. into eight provinces which combine common elements from the ecological and cultural contexts over large geographical areas; the WRNF is within the Rocky Mountain Province. Site development, sustainability, and architectural character should conform to BEIG guidelines described for this Province.

## **AFFECTED ENVIRONMENT**

### **Scenic Characteristics of A-Basin’s SUP Area**

A-Basin is located on the western slope of the Continental Divide within the WRNF. High elevation peaks characterize the Continental Divide, including Grays Peak (14,270 feet) and Torreys Peak (14,267 feet). With a summit elevation over 13,000 feet, A-Basin has some of the highest skiable terrain in the U.S., providing unobstructed views of the Continental Divide and surrounding NFS lands.

Located along the Continental Divide, the topography of A-Basin is comprised of steeply sloped side walls, large open bowls, basins, terraces, and rolling hills. A-Basin’s SUP area can be segmented into two areas: the developed, lift-served portion of the SUP area (including Montezuma Bowl on A-Basin’s south side) and the undeveloped Beavers located on the western edge of the SUP boundary.

The development of ski trails, chairlifts, infrastructure, and skier facilities has occurred on NFS lands at A-Basin since the ski area’s inception in 1946, when A-Basin’s base area was established. Since that time, approximately 958 acres of skiable terrain have been developed on NFS lands within A-Basin’s 1,872-acre SUP area, including approximately 676 acres of lift-served terrain. A-Basin’s chairlift network currently includes six aerial chairlifts and two carpet conveyors. Skiing terrain within A-Basin’s SUP area is located both above and below treeline. Parking lots are located immediately adjacent to Highway 6 within walking distance of the Black Mountain Express, Molly Hogan and Pallavicini chairlifts. All ski area-related chairlifts, trails, parking, and skier service facilities are located on NFS lands within A-Basin’s SUP area.

Vegetation cover throughout the SUP area varies due to the elevation changes, slope aspect, and gradient. Because of its high elevation, vegetation cover is limited to those plants that occur in the alpine zones (11,000 to 11,500 feet) and subalpine (9,000 to 11,500 feet) zones of Colorado. Vegetation within A-Basin’s subalpine zone is largely dominated by various types of low-lying grasses and forbs. At the lower elevations, below 11,400 feet, vegetation cover becomes denser with canopy cover varying with

---

<sup>69</sup> USDA Forest Service, 2001

<sup>70</sup> Ibid.

elevation. Dominant species include Engelmann spruce, Douglas-fir, and sub-alpine fir. The distinctive vegetation patterns typical of cut ski trails contribute to the scenic character of A-Basin's current operational boundary area.

A-Basin's base area is readily visible to drivers along Highway 6 in the immediate foreground view as they pass by the ski area on their ascent or descent of Loveland Pass. (The upper terminals of the Black Mountain Express or Pallavicini chairlifts are not visible from the base area.) The majority of A-Basin's chairlift and trail network (with the exception of Montezuma Bowl), as well as parking and guest service facilities, are seen in the foreground and middleground from the final switchback on the descent from Loveland Pass. The Lenawee Mountain and Norway chairlifts, as well as associated trails, are visible from the summit of Loveland Pass in the middleground distance zone.

The existing scenic integrity of A-Basin's existing chairlift and trail network on the front side of the mountain, as well as related infrastructure, buildings, and parking lots is *Very Low*.

### **Scenic Characteristics of Areas Proposed for Alteration**

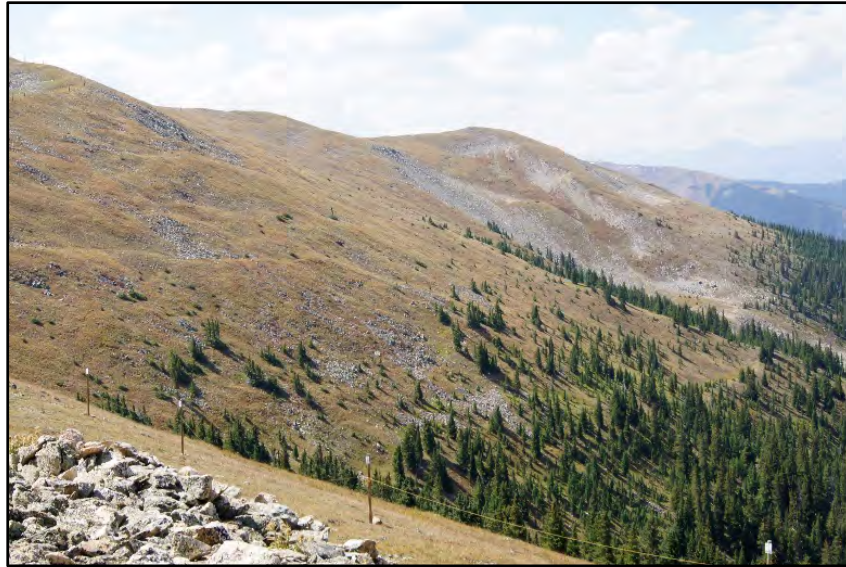
Project areas associated with specific proposed project elements are discussed below to define the baseline scenic conditions of potentially affected areas. Analysis of the impacts of the proposed projects and activities is included in the Direct and Indirect Environmental Consequences section of this chapter.

#### ***The Beavers***

The area known as the Beavers is located within the western edge of the A-Basin SUP area, between terrain accessed by the Pallavicini chairlift and Montezuma Bowl, southeast of Highway 6. The area is north-facing, and is visible in the foreground and middleground distance zones to motorists as they approach A-Basin from the Keystone Resort area on Highway 6. The Beavers is regularly utilized by skiers/riders as backcountry terrain but does not currently have any developed ski trails or other ski area infrastructure. This Project Area is visible from Critical Viewpoint 1 (refer to Figure 3).

Vegetation cover in the Beavers is similar to A-Basin's front side terrain and is typical of an alpine zone and sub-alpine zone environment. At the higher elevations, above approximately 11,800 feet, the area consists of an open bowl with patchy rock outcrops and alpine grasses. As the elevation decreases, vegetation becomes thicker and transitions into a dense stand of Engelmann spruce and subalpine fir trees. Photo 3D-1 illustrates the view of the Beavers (towards the southwest) from near the top of the Pallavicini chairlift. This area has an existing scenic integrity of *Very High*.

**Photo 3D-1:  
View of the Beavers from Near the Top of Pallavicini Chairlift**



Within the Beavers is an area of terrain called the Steep Gullies. The Steep Gullies have a northwest aspect with significant rock outcrops at high degree angles. Below the rock outcroppings, the Steep Gullies are densely vegetated with Engelmann spruce and subalpine fir. Photo 3D-2 illustrates the view of the Steep Gullies (towards the south) from a viewpoint along Highway 6.

**Photo 3D-2:  
View of Steep Gullies from Highway 6**



### *Zuma Access Surface Lift*

The Zuma Access surface lift is proposed to provide transportation from the Lenawee Mountain and Norway chairlifts to Montezuma Bowl. This Project Area is located above treeline and the lift would be located adjacent to an existing mountain road. The area is characterized by bare, loose rock and minimal vegetation. The existing scenic integrity of the area is *Very Low*. Photo 3D-3 illustrates the view of the existing mountain road and top terminal of the Zuma chairlift (towards the southeast) from a viewpoint near the top terminal of the Lenawee Mountain chairlift.

**Photo 3D-3:**  
**View Towards Zuma Chairlift from Lenawee Mountain Chairlift Top Terminal**



### *Pallavicini and Molly Hogan Chairlift Replacements*

The bottom terminal of the existing Pallavicini chairlift is located slightly west of the base area, and provides access to skiable terrain which is mostly advanced and expert. The existing chairlift is a fixed-grip double. This chairlift is visible from Highway 6 and the existing scenic integrity of its location is *Very Low*.

The existing Molly Hogan chairlift is located near the base area, slightly west of the Black Mountain Express. The existing chairlift is a fixed-grip double, and provides access to novice and beginner terrain. This chairlift is visible from Highway 6 and the existing scenic integrity of its location is *Very Low*.

### *Norway Chairlift Removal*

The bottom terminal of the existing Norway chairlift is located slightly to the west of the top terminal of the Black Mountain Express chairlift at mid-mountain. The top terminal is located adjacent to the Snow Plume Refuge near the top terminal of the Lenawee Mountain chairlift. The existing chairlift is a fixed-

grip double. The chairlift is not visible from outside the SUP area, and the existing scenic integrity of its location is *Very Low*.

### *Canopy Tour*

The proposed canopy tour would be located largely within the developed chairlift and trail network on the lower portion of the front side of the ski area where the existing scenic condition is highly modified. The area is characterized by cleared ski trails, chairlifts and other ski area infrastructure including base area facilities, snowmaking equipment, and mountain access roads. The Project Area is below treeline, and vegetation is primarily Engelmann spruce and subalpine fir with an average canopy height of approximately 45 to 60 feet. This Project Area is visible from Critical Viewpoints 2, 3, and 4 (refer to Figures 5, 7, and 9).

Guests would ride the Black Mountain Express chairlift to the beginning of the tour, near the Black Mountain Lodge and other infrastructure. The tour would end in the developed base area. The existing scenic integrity of this area is *Very Low*.

### *Challenge Course*

The proposed challenge course would be located near the developed base area in a series of tree islands. Vegetation in the tree islands is primarily Engelmann spruce and subalpine fir, with an average canopy height of approximately 45 to 60 feet. This Project Area is visible from Critical Viewpoints 2 and 4 (refer to Figures 5 and 9).

The Project Area is adjacent to the existing Black Mountain Express chairlift, the Carpet II conveyor, and encompasses a portion of the *Pika Place*, *Gracie's Glade*, and *Ramrod* ski trails. This area is heavily influenced by existing ski area infrastructure. The existing scenic integrity of this area is *Very Low*.

### *Grading Projects*

The Pallavicini and Lenawee summit grading projects would be located proximate to existing ski area infrastructure where the landscape is already altered. The Pallavicini grading would occur above treeline where the terrain is rocky. The Project Area is located adjacent to the top terminal of the Pallavicini chairlift within the ski trail network. Photo 3D-4 shows the Project Area looking north from near the top of the *West Wall* ski trail; the slope in the picture would be graded to provide a more level route from the top terminal of the Pallavicini chairlift. The existing scenic integrity of this area is *Very Low*.

**Photo 3D-4:**  
**View of Top Terminal of Pallavicini Chairlift and Proposed Grading Area**



Similarly, the Lenawee summit grading project would be located above treeline in an area characterized by rocky terrain and ski area infrastructure. The project would be located adjacent to the existing top terminals of the Lenawee Mountain and Norway chairlifts and the Snow Plume Refuge. Photo 3D-5 shows a portion of the Project Area looking northwest from a viewpoint in front of the Snow Plume Refuge and the top terminal of the Lenawee Mountain chairlift. The existing scenic integrity of this area is *Very Low*.

**Photo 3D-5:**  
**View to Northwest from Snow Plume Refuge**



## DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

### **Alternative 1 – No Action**

No changes or modifications are included in Alternative 1 that would affect the scenic quality of A-Basin's SUP area. Generally speaking, the SUP area would continue to meet, and in some cases exceed, the SIO of *Low* and *Very Low*.

The existing condition as viewed from each of the critical viewpoints is portrayed in Figures 3, 5, 7 and 9. No changes or modifications would be approved that would change these existing conditions. These critical viewpoints are intended to serve as the baseline for which to compare the effects of implementation of Alternative 2.

- *Critical Viewpoint 1 – Highway 6 (Lower)*: No ski area infrastructure is currently visible from this viewpoint.
- *Critical Viewpoint 2 – Highway 6 (Upper)*: The current view from this location is dominated by existing ski area infrastructure (including ski trails, mountain roads, and a parking lot), as well as Highway 6.
- *Critical Viewpoint 3 – Upper Chisholm*: Existing ski trails are visible within the foreground from this viewpoint.
- *Critical Viewpoint 4 – Base Area*: The current view from this location is dominated by existing ski area infrastructure (including ski trails, mountain roads, and the Black Mountain Express chairlift).

### **Alternative 2 – Proposed Action**

Implementation of the Proposed Action would incrementally contribute to the developed character of A-Basin's SUP area, which is identified in the 2002 Forest Plan as Management Area 8.25 – Ski Area (Existing and Potential). With adherence to management requirements (defined in Table 2-2), none of the proposed projects are expected to increase scenery impacts to the character of the SUP area, such that it would not meet the SIO of *Low* or *Very Low*.

Overall, the projects contained in Alternative 2 would add incrementally to the scenic character of A-Basin's SUP area as a developed recreation site. All proposed projects would be consistent with the SIO of *Low* or *Very Low*. With the exception of the addition of ski area infrastructure and terrain in the Beavers, proposed projects would be located within the existing developed trail network or otherwise near existing ski area infrastructure, which would reduce required vegetation clearing and the overall scenery impact. Proposed projects in the Beavers would result in an impact outside of the existing developed area and would be visible for motorists on Highway 6.

In the following analysis, proposed multi-season recreation projects are considered in terms of how they “harmonize with the natural environment,” as defined and discussed in FSM 2343.14. The reader is referred to Appendix C of this document for additional information.

### *The Beavers*

The Beavers chairlift and associated terrain would be visible from multiple locations within A-Basin’s SUP area, as well as from locations along Highway 6. Proposed projects in the Beavers would be visible from Critical Viewpoint 1. Refer to Figure 4 for a visual simulation of the potential scenic condition under Alternative 2. These projects would meet the SIO of *Low*.

### The Beavers Chairlift

The chairlift terminal locations are planned to minimize the amount of ground disturbance necessary for construction while also providing efficient skier flow and access. The chairlift terminals would be approximately 30 to 35 feet wide, 50 to 55 feet long and 20 to 24 feet tall. The proposed chairlift terminals and towers would be colored to maximize blending with the surrounding summer landscape. Photo 3D-6 provides an example of a typical fixed-grip chairlift terminal. Construction of the chairlift would require a corridor of variable width (average 45 feet) to be created through the forest canopy. To provide a variable width, additional tree removal would occur, although, balancing the aesthetic impact with wildlife habitat is an important consideration. PDC for the lift-line would minimize the negative scenic effect of a straight corridor by creating larger openings in key locations, to better blend into the surrounding landscape as viewed in winter. Installation of the chairlift towers would require excavation for foundations.

**Photo 3D-6:  
Example of a Fixed-Grip Chairlift Terminal**



Neither the top or bottom chairlift terminal would be visible from Critical Viewpoint 1. The top terminal could be visible in the middleground or background from locations outside of A-Basin's SUP area (including Loveland Pass and from within Keystone Resort's SUP area), but it is likely that the structure would be indiscernible. Chairlift towers and the cleared chairlift corridor would be visible in the middleground from Critical Viewpoint 1 and other locations along Highway 6.

#### The Beavers Terrain

The Proposed Action includes the construction of two new ski trails (B-2 and B-4) and the addition of tree skiing and open bowl skiing in the Beavers and the Steep Gullies. There would be no scenic impacts resulting from the addition of open bowl skiing terrain because no vegetation removal would be required. Skiing in the Steep Gullies would also have no visual impact because vegetation removal would be limited to incidental tree removal along the egress routes.

From Critical Viewpoint 1, portions of Trails B-2 and B-4 could be visible. Additionally, a portion of tree skiing Trail B-3 and tree skiing areas A and B could be visible. Because these tree skiing projects would include minimal tree removal (up to approximately 25 percent of tree basal area throughout 100-foot wide corridors), the scenic impact would be minimal and likely indiscernible.

While the lower portions of Trails B-2 and B-4 would be fully cleared of vegetation (average width of approximately 110 feet), trail edges would be feathered or scalloped to provide a variable line, thereby minimizing linear cuts in overstory vegetation. Trails have been designed with consideration for the aesthetic resource. Larger inter-trail tree islands would be maintained to minimize the impact of cleared trails. The majority of trails would not be graded, so revegetation/soil stabilization efforts would be expected to have a high success rate. Cleared areas would be revegetated with a native grass mix.

The lower portions of Trails B-1 and B-3 would be tree skiing, and would, therefore, have a minimal impact on scenic resources. These trails would require the removal of approximately 20 to 25 percent of tree basal area. This clearing would not be homogenous and would minimize linear cuts in overstory vegetation.

#### Ski Patrol Makeup Room

The new explosives magazine and makeup room near the top of the Steep Gullies could be visible in the middleground from locations along Highway 6. The makeup room would be approximately 6 feet by 10 feet with siding and color that would blend in with the surrounding landscape. The building would have either solar panels on the roof or a small wind generator to power lighting. Due to the small size of the structures, the scenic impact would be minimal. Photo 3D-7 depicts a typical makeup room structure with an example of a solar array.

**Photo 3D-7:  
Example of Explosive Makeup Room with Solar Panel**



#### *Zuma Access Surface Lift*

This project would be visible to viewers near the top terminals of the Lenawee Mountain and Zuma chairlifts. The area is currently free from vegetation, so no vegetation would be removed. The project would be located in a previously disturbed area (in an existing mountain road) proximate to other ski area infrastructure, and would, therefore, result in a minor and incremental impact to visual resources. This project would meet the SIO of *Very Low*.

#### *Pallavicini and Molly Hogan Chairlift Replacements*

The replacement of the Pallavicini and Molly Hogan chairlifts would not impact visual resources. The new chairlifts would be located in the same alignments and would be the same size and style as the existing chairlifts (Photo 3D-4 depicts the existing top terminal of the Pallavicini chairlift). Construction activities would result in short-term impacts to scenic resources, but visual characteristics in the long-term would not change from existing conditions. These projects would be visible from multiple locations within A-Basin's SUP area, as well as from Highway 6. These projects would meet the SIO of *Very Low*.

#### *Norway Chairlift Removal*

By removing infrastructure from within A-Basin's SUP area, this project would improve the quality of scenic resources. The chairlift would no longer be visible; therefore, the scenic character in this area would become more natural-appearing. This project would exceed the SIO of *Very Low*.

#### *Canopy Tour*

The proposed canopy tour would be visible from Critical Viewpoints 2, 3, and 4. Refer to Figures 6, 8, and 10 for a visual simulation of the potential scenic condition under Alternative 2.

The proposed canopy tour would consist of a single cable connecting a number of stations. While the height of each station would vary based on local topography, in general, they would be approximately 30 feet tall. Each station would measure approximately 12 feet by 12 feet. The platforms would be constructed of wooden and/or natural-looking materials to the extent possible. Additional information about the design of these structures is included in the project file. Guy wires from each platform would be required for structural stability. Buck and rail or temporary winter fencing would enclose the areas where the guy wires tie into the ground. The canopy tour stations would be located close to ski trails, and would, therefore, require fencing on the uphill side of the stations and guy wires for safety purposes. The stations would be set against or in tree islands. If permanent fencing such as buck and rail were used, it would blend with the tree island background. Overstory vegetation clearing along the cable segments would be required to maintain a corridor approximately 8 to 10 feet wide. Because the project would be located within the forest canopy, vegetation clearing would be required for most segments. The facilities and structures would be designed to blend with the environment and would meet the intent of the BEIG.

The canopy tour would generally be located in the vicinity of existing ski trails and lift infrastructure on the front side of the ski area. The project would be visible in the immediate foreground for skiers on the *Wrangler*, *Chisholm*, *TB Glade*, *Weasel Way*, *Sundance*, *North Fork*, and *High Noon* ski trails which the canopy tour would cross. Stations and cable segments would also be visible from the Black Mountain Express chairlift and the base area. The top station of the canopy tour would likely be obscured from view by surrounding vegetation. The second station would be visible from Critical Viewpoint 3 (refer to Figure 8) near the *Chisholm* and *TB Glade* ski trails. The bottom station would be located in the base area. Because the stations of the canopy tour would generally be shorter than the surrounding vegetation, the stations would likely be well-screened and less visible from the middleground and background distance zones. The zip line segments crossing the open areas (including ski trails) would be more visible. Minimal vegetation clearing for the canopy tour cable corridors would likely be visible in the foreground distance zone.

Figure 6 shows the potential view from Critical Viewpoint 2, including the canopy tour (on the left of the visual simulation) and the challenge course (on the right of the visual simulation) on the front side of the mountain from Highway 6.

The proposed canopy tour would add incrementally to the scenic character of A-Basin's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

#### Harmonizing with the Natural Environment

The canopy tour is designed to avoid tree removal, blend with the forest canopy and utilize natural materials in its construction. BEIG concepts and criteria would be incorporated into final design.

The canopy tour would be situated adjacent to and on the periphery of existing snow-sports infrastructure in the most developed part of the ski area (designated Zone 2 in the MDP). The canopy tour would require

minimal tree removal for stations and limited clearing for zip corridors (narrower than an average ski trail), thereby limiting their scenic footprint. The stations would generally be shorter than the surrounding overstory vegetation and would, therefore, be partially screened which would make them more visually consistent with and subordinate to the vegetation and landscape of the area. The final tower would be located in the base area where it would be surrounded by existing ski area infrastructure.

This project would require minimal grading and vegetation clearing (approximately 2 acres of total disturbance).

### *Challenge Course*

The proposed challenge course would be visible from Critical Viewpoints 2 and 4 (refer to Figures 6 and 10 for a visual simulation of the potential scenic condition under Alternative 2). The project would also be visible from within A-Basin's SUP area.

The proposed challenge course would be located near the bottom two stations of the proposed canopy tour. While the design of the project has not been determined, it would consist of a series of aerial platforms approximately 40 feet tall connected by various activities (e.g., rope bridges). The challenge course would be visible in the immediate foreground/foreground from the Black Mountain Express chairlift, the base area, and skiers on the *Ramrod* ski trail. The final design of the challenge course would incorporate guidance contained in the BEIG, and would blend with surrounding vegetation and landscape features to the extent possible. The dense vegetation in this area would provide screening for many of the structures. However, some of the project elements could cross over the *Ramrod* ski trail where they would be more visible. This project would be constructed on a slope and would likely include multiple levels and an irregular shape, as opposed to a "box-type" structure. A small storage shelter would be constructed of wooden and/or natural-looking materials. This structure would likely resemble other similar storage structures currently found across the SUP area.

The challenge course would be located in an area of A-Basin's SUP that is currently developed. It is unlikely that any components of this project would be visible and distinguishable from the middleground and background distance zones.

The proposed challenge course would add incrementally to the scenic character of A-Basin's SUP area as a developed recreation site. This project would be consistent with the SIO of *Very Low*.

### Harmonizing with the Natural Environment

Due to the types of materials proposed for this project, it is likely that this project would be less visually intrusive than other infrastructure (e.g., chairlifts) already present throughout A-Basin's SUP area. The final design of the project would incorporate natural and natural-looking materials, and would consider the surrounding vegetation and landscape. Additionally, the height of the project would likely be similar to or less than the height of surrounding vegetation, and would thus be partially screened and visually

subordinate to the surrounding landscape. This project would require minimal modifications to topography (approximately 0.5 acre of grading).

### *Grading Projects*

These projects would not have a noticeable impact on scenic resources. Short-term impacts would occur during construction, but the duration of these impacts would be limited and they would be located in the vicinity of other ski area infrastructure in areas where the terrain has been previously modified. In the long-term, these projects would result in the modification of two areas approximately 0.5 acre each. While these projects would add incrementally to the modified/altered character of the Project Area, they would be consistent with the SIO of *Very Low*.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of scenery extends from A-Basin's inception as a ski area in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of scenic resources are limited to public and private lands in the vicinity of the A-Basin's SUP area and private lands along Highway 6 between the top of Loveland Pass and I-70 in the Town of Silverthorne.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on scenic resources and are analyzed below:

- A-Basin MDP Update
- Keystone Resort MDP
- Continued Build-out of Summit County
- Continued Build-out of Snake River Basin
- Residential Developments in the Lower Blue River Basin
- WRNF Forest Plan – 2002 Revision

This DEIS analyzes the potential impacts of all projects in A-Basin's MDP Update except for a new snowmaking reservoir and a zip line. A new snowmaking reservoir would likely be visible from Highway 6, and considered cumulatively with the proposed projects, would add incrementally to the developed character of A-Basin's SUP area. Additionally, a zip line on the front side of the ski area would result in additional infrastructure within the developed ski area and would be visible from viewpoints along Highway 6. This project would add incrementally to the modified character of this area.

Projects included in the Keystone Resort MDP could be visible from Highway 6. The development of additional ski area terrain and infrastructure could cumulatively impact scenic resources along the Highway 6 corridor, which is highly travelled.

Continued build-out and residential developments in Summit County, the Snake River Basin, and the Lower Blue River Basin would impact the scenic character of the Highway 6 corridor between the summit of Loveland Pass and I-70 in Silverthorne. These projects would add incrementally to the modified nature of the scenic resource. Considered cumulatively with the proposed projects, these projects would further detract from the natural character of scenic resources along the heavily-travelled Highway 6.

As discussed above, the WRNF 2002 Forest Plan includes mechanisms for the management of scenic resources forest-wide. While the 2002 Forest Plan includes numerous management prescriptions that could impact scenic resources across the Forest, the application of Forest Plan standards and guidelines will ensure that scenic quality is maintained or improved.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Additional developed terrain and infrastructure in previously undisturbed portions of the SUP area would represent irretrievable effects to scenic resources within the Beavers. However, this commitment of the scenic resource is not irreversible because the Beavers chairlift and associated facilities could be removed and, in time, the area could be reclaimed and revegetated, restoring its natural appearance.

The addition of multi-season activities and infrastructure in the SUP area would represent irretrievable effects to scenic resources at A-Basin. However, this is not irreversible because facilities could be removed and, in time, areas could be reclaimed and revegetated, restoring their natural appearance.

## **E. CULTURAL RESOURCES**

### **SCOPE OF THE ANALYSIS**

This cultural resources assessment is mandated by the National Historic Preservation Act of 1966 (NHPA). Section 106 of the NHPA requires that federal agencies take into account the effects of a federal undertaking on any cultural resource that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Cultural resources may refer to sites, areas, buildings, structures, districts, and

objects which possess scientific, historic, and/or social values of a cultural group or groups as specified by 36 CFR 296.3.

This assessment is based on archaeological sources that indicate the historic and prehistoric utilization of lands, such as hunting, gathering, grazing, timber harvesting, and natural resource transport, within and adjacent to A-Basin's SUP boundary (refer to Figure 1), known as the APE. NRHP eligibility is evaluated in terms of the integrity of the resource; its association with significant persons, events, or patterns in history or prehistory; its engineering, artistic, or architectural values; or its information potentially relative to important research questions in history or prehistory. The significance of NRHP eligibility of cultural resources is determined by the Forest Archaeologist in consultation with the State Historic Preservation Officer (SHPO).

## AFFECTED ENVIRONMENT

The Analysis Area is based on the *Class III Cultural Resource Inventory of Arapahoe Basin Ski Area* report contained in the project file.

Historic land use in this area was initially limited to explorers and fur trappers who generally utilized the region's major drainages, such as the Colorado River. Mining and prospecting activities commenced in Summit County as early as the 1860s, and increased in intensity for the next several years. In 1881 the Dillon Mining Company established the trade-post Town of Dillon on the northeast bank of the Snake River, although the town site was subsequently moved several times. Following this boom period, in 1893, Congress effectively de-monetized silver, which resulted in the "silver panic" and a lengthy local economic downturn. The mining boom in the Rockies drove the expansion of the railways and fostered the development of agriculture, ranching, and other local industries that began primarily to support mining efforts. Eventually, tourism, including hunting, fishing, rafting, and skiing, became important to the local economy. Colorado experienced a skiing "boom" in the 1940s, and during the 1946/47 season the Arapahoe Basin Ski Area began to serve tourists.

Prior to fieldwork for this project, a files search consisting of a one mile radius surrounding the project area was conducted through the Office of Archaeology and Historic Preservation online Compass database on August 22, 2013. A historic General Land Office map for T5S/R76W (1884) was also inspected. As a result of the files search, of the forty previously recorded sites within the 1-mile buffer of the current project area, only one site (5ST227) is within or close to the project area. This site is a prehistoric artifact scatter and open camp. Of the forty sites, the majority (n=29, 80 percent) are historic. Eight (20 percent) are prehistoric, and the remaining three are multi-component. The vast majority of historic sites is associated with mining, and includes mines, tailings dumps, debris scatters, tunnels, and small structures. Additionally, local historical maps, online records, a literature review, and in-house records searches were used to identify potential cultural resources.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

Under the No Action Alternative, new development projects would not occur. A-Basin would continue to operate under its current configuration and capacity. Because no ground disturbance is proposed under the No Action Alternative, there is no potential to affect the historic sites within the area of potential effect as a result of the No Action Alternative.

### **Alternative 2 – Proposed Action**

The one newly recorded isolated feature and one previously recorded prehistoric site within the APE were recorded and found to be not eligible for inclusion on the NRHP. Therefore, there would be no adverse effects to historic properties determined by the Forest Service and SHPO. Topographically, the ruggedness of the area provides only limited level areas suitable for prehistoric or historic sites. Because of this, expectations for the discovery of cultural materials are low. As stated in the PDC (Table 2-2), if previously-unknown cultural resources or artifacts are discovered during implementation of any approved projects, all ground disturbing activities will cease, and SHPO consultation will commence.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of cultural resources extend from A-Basin's inception as a ski area in 1946 through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of cultural resources are limited to public and private lands in the vicinity of the A-Basin SUP area.

### **Past, Present, and Reasonably Foreseeable Future Projects**

From a cumulative perspective, since implementation of projects contained in the Proposed Action were determined to have "no effect" on any known NRHP listed or eligible historic properties, by definition, no cumulative impacts to cultural resources are identified specifically related to the A-Basin projects.

All projects listed in Appendix A would require the completion of requisite cultural surveys to satisfy State and Federal requirements. As stated above, this project has been determined to have no adverse effect either independently or cumulatively to cultural resources.

## IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Implementation of projects contained in the Proposed Action were determined to have *no adverse effect* on known NRHP listed or eligible historic properties; therefore, there are no irreversible and/or irretrievable commitments of cultural resources.

## F. VEGETATION AND BOTANY

### SCOPE OF THE ANALYSIS

This analysis of vegetation and botanical resources is tiered to the WRNF Forest Plan FEIS, and incorporates by reference the Forest Plan.<sup>71</sup> Species included in this analysis were identified as listed proposed, threatened, endangered, or sensitive species. Although they carry no legal status, plant SOLC and SIVC were also included in this analysis as they are a component of biological diversity on the WRNF, which is required to be maintained by the National Forest Management Act. The findings of the botanical Biological Assessment (BA) and Biological Evaluation (BE), which are also included in Botanical Biological Report, are summarized herein.<sup>72</sup> The spatial scope of analysis is 995 acres in size and encompasses the front side of the existing ski area, as well as the Beavers terrain and undeveloped areas within the SUP boundary. Details of the vegetation communities, noxious weeds, and forest health within the Analysis Area are described below.

### AFFECTED ENVIRONMENT

#### Vegetative Communities

Vegetation types within the Analysis Area include Engelmann spruce—subalpine fir forests (*Picea engelmannii* – *Abies bifolia*), alpine tundra, riparian and wetland habitats, and disturbed ski-runs. Each of the vegetation types is summarized below in Chart 3F-1. A vascular plant species list for the Analysis Area is contained in the project file.

The lower elevations of the Project Area are dominated by Spruce-fir forests with large, relatively unfragmented, spruce-fir forests below the Beavers Bowl in the western portion of the Analysis Area. In general, Engelmann spruce is dominant, with subalpine fir intergrading at the lower elevations. Alpine tundra occurs above 12,000 feet in elevation. Much of the tundra within the vicinity of proposed projects is dry and rocky. The alpine tundra supports a variety of native alpine plant species common to the region.

In total, approximately 76 acres of wetlands were mapped within the Analysis Area, including 15 acres of forested wetlands, 55 acres of scrub-shrub wetlands, and 6 acres of emergent wetlands (refer to Chapter 3, Section J – Wetlands for additional information).

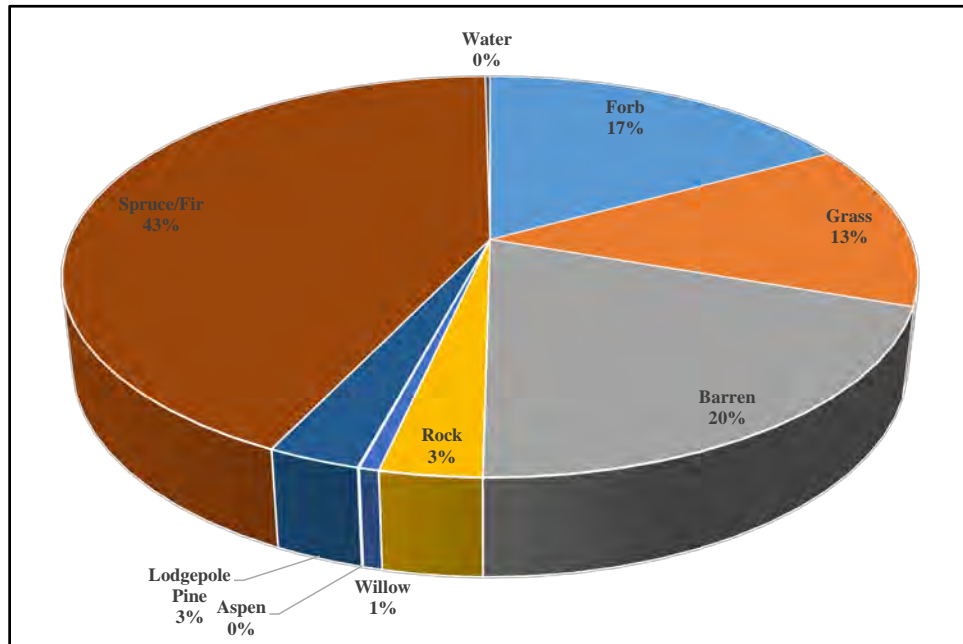
---

<sup>71</sup> USDA Forest Service, 2002a

<sup>72</sup> The full Botanical Biological report is contained in the project file (see Western Ecological Resource, Inc. 2016).

Disturbed land and introduced plants occur on developed ski terrain, as well as along edges of roads and along pipelines. The majority of the ski trails are dominated by non-native graminoids.

**Chart 3F-1:**  
**Relative Acreage of Vegetation Cover Types within A-Basin's SUP Area**



Source: SE Group, 2015

### **Threatened and Endangered Species**

The USFWS plant species include the federally Threatened Penland's alpine fen mustard (*Eutrema penlandii*) and the federally Endangered Osterhout milkvetch (*Astragalus osterhoutii*). Brief descriptions of each of these species are provided below, as well as rationale for their exclusion from further analysis. No critical habitats are currently designated for any listed plant species within the Analysis Area. Please note, the WRNF also includes DeBeque phacelia (*Phacelia scopulina* var. *submutica*), Colorado hookless cactus (*Sclerocactus glaucus*) and Ute ladies'-tresses orchid (*Spiranthes diluvialis*) as being potentially present on the planning unit. However, none of these species are known from Summit County, they have no habitat within the Analysis Area, and are hence excluded from analysis.

**Table 3F-1:  
Federally Listed and Proposed Plants for Summit County, Colorado**

Species (Common Name, Scientific Name)	Habitat Description	Species Excluded from Analysis?	Rationale
Penland's alpine fen mustard <i>Eutrema penlandii</i> Threatened	Alpine constantly moist areas, often near snowbeds. Elev. 11,800–12,800'	Yes	No habitat within federal Action Area
Osterhout's milkvetch <i>Astragalus osterhoutii</i> Endangered	Highly seleniferous, grayish-brown clay soils derived from shale of the Niobrara, Pierre and Troublesome formations. Elev. 7,400–7,900'	Yes	No habitat within federal Action Area

Note: For purposes of this analysis, the federal Action Area is equal to the Analysis Area.

None of the species in Table 3F-1 are known to exist on the Dillon Ranger District. While these species are known to occur elsewhere on the WRNF or in Colorado, they have been eliminated from detailed analysis because their habitats do not occur on the Dillon Ranger District, they have no affinities to Project Area habitats, and/or the Project Area is outside of the species' range. No portion of the Project Area or vicinity has been designated critical habitat by the Secretary of the Interior.

## **R2 Sensitive Species**

Table 3F-2 lists the 33 species either known or suspected to occur on the WRNF along with brief habitat descriptions, and shows the plant species either analyzed or excluded from further analysis, and the rationale for exclusion. A total of 24 sensitive plant species are carried forward into the analysis. Rationale is supported where appropriate by rare plant survey results. Species excluded from analysis will not be discussed further in this document. The species analyzed are highlighted in bold throughout Table 3F-2.

**Table 3F-2:  
R2 Sensitive Plant Species**

Name (Common Name, Scientific Name)	General Habitat and Colorado Range	Species Excluded from Analysis?	Rationale
<b>Sea pink</b> <i>Armeria maritima</i> subsp. <i>sibirica</i>	<b>Grassy tundra slopes, on wet, sandy, or spongy organic soils; 11,460–12,580'; Park and Summit counties.</b>	No	<b>Species Analyzed</b>
Park milkvetch <i>Astragalus leptaleus</i>	Ecotone of saturated and dry soils; moist swales and meadows; 6,000–10,000'; Chaffee, Custer, Eagle, Fremont, Gunnison, Jackson, Larimer, Park and Summit counties.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
<b>Upswept moonwort</b> <i>Botrychium ascendens</i>	<b>Disturbed but stabilized subalpine areas; several sites in Colorado.</b>	No	<b>Species Analyzed</b>

**Table 3F-2:  
R2 Sensitive Plant Species**

<b>Name (Common Name, Scientific Name)</b>	<b>General Habitat and Colorado Range</b>	<b>Species Excluded from Analysis?</b>	<b>Rationale</b>
<b>Paradox moonwort</b> <i>Botrychium paradoxum</i>	Moist meadows to sparsely vegetated upland; one site in Colorado on west slope.	No	Species Analyzed
<b>Smooth northern-rockcress</b> <i>Braya glabella</i> subsp. <i>glabella</i>	Calcareous substrates, especially Leadville limestone; sparsely vegetated gravelly slopes above timberline; 12,000–13,000'; Chaffee, Gunnison, Park and Pitkin counties.	No	Species Analyzed
<b>Lesser panicled sedge</b> <i>Carex diandra</i>	Montane and subalpine wetland fens; 7,000–9,600'; Boulder, Garfield, Grand, Jackson, Larimer and Saguache counties.	No	Species Analyzed
<b>Livid sedge</b> <i>Carex livida</i>	Mineral rich wetland fens; 9,000–10,100'; Boulder, Grand, Jackson, Larimer and Park counties.	No	Species Analyzed
<b>Yellow lady's slipper</b> <i>Cypripedium parviflorum</i>	Moist forests including ponderosa pine, Douglas-fir, and aspen; 7,400–8,500' in Colorado; Clear Creek, Custer, Douglas, El Paso, Garfield, Huerfano, Jefferson, La Plata, Larimer, Las Animas, Montrose, Park, Pueblo and Teller counties.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
<b>Clawless draba</b> <i>Draba exunguiculata</i>	Alpine on rocky and gravelly slopes or fell fields; 11,700–14,000'; Boulder, Clear Creek, El Paso, Gilpin, Grand, Lake, Park and Summit counties.	No	Species Analyzed
<b>Gray's Peak draba</b> <i>Draba grayana</i>	Alpine and subalpine on tundra, gravelly slopes or fell fields; 11,600–14,100'; Chaffee, Clear Creek, Gilpin, Grand, Huerfano, Larimer, Park, Pitkin, Saguache and Summit counties.	No	Species Analyzed
<b>Weber's draba</b> <i>Draba weberi</i>	Splash zones, among the rocks along streams and lakes and spruce forests; 11,000–11,500'; Summit and Park counties.	No	Species Analyzed

**Table 3F-2:  
R2 Sensitive Plant Species**

<b>Name (Common Name, Scientific Name)</b>	<b>General Habitat and Colorado Range</b>	<b>Species Excluded from Analysis?</b>	<b>Rationale</b>
<b>Roundleaf sundew</b> <i>Drosera rotundifolia</i>	Among sphagnum peat moss on the margins of ponds, fens and floating peat mats; 9,100–9,800'; Grand, Gunnison and Jackson counties.	No	Species Analyzed
Giant helleborine <i>Epipactis gigantea</i>	Warm-water seeps and springs. 4,800–8,000'; Archuleta, Las Animas, Chaffee, Delta, Mesa, Montrose, Moffat, and Saguache counties.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Dropleaf buckwheat <i>Eriogonum exilifolium</i>	Sagebrush flats; 7,500–9,000'; North and Middle Parks in Larimer, Jackson and Grand counties.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
<b>Altai cottongrass</b> <i>Eriophorum altaicum</i> var. <i>neogaeum</i>	Open areas with hydric soils, fens; 10,160 -13,200'; Eagle, Gunnison, Hinsdale, La Plata, Mineral, Park, Pitkin, Saguache, San Juan and San Miguel counties; includes <i>Eriophorum chamissonis</i>	No	Species Analyzed
<b>Slender cottongrass</b> <i>Eriophorum gracile</i>	Montane and subalpine fens, saturated soils; 8,100–11,140'; Gunnison, Jackson, Larimer, Las Animas, Park, San Miguel and Summit counties.	No	Species Analyzed
<b>Hall's Fescue</b> <i>Festuca hallii</i>	Alpine and subalpine grasslands and meadows; 8,500–11,500'; Huerfano and Larimer counties.	No	Species Analyzed
<b>Simple kobresia</b> <i>Kobresia simpliciuscula</i>	Fens and moist alpine areas; 8,970–12,800'; Boulder, Clear Creek, Grand, Gunnison, Park, and Summit counties.	No	Species Analyzed
<b>Colorado tansyaster</b> <i>Machaeranthera coloradoensis</i>	Gravelly areas in mountain parks, slopes and rock outcrops up to dry tundra; 7,600–13,000'; Dolores, Gunnison, Hinsdale, La Plata, Lake, Mineral, Park, Pitkin, Gunnison, Rio Grande, Saguache and San Juan counties.	No	Species Analyzed

**Table 3F-2:  
R2 Sensitive Plant Species**

<b>Name (Common Name, Scientific Name)</b>	<b>General Habitat and Colorado Range</b>	<b>Species Excluded from Analysis?</b>	<b>Rationale</b>
<b>Kotzebue's grass of Parnassus</b> <i>Parnassia kotzebuei</i>	Alpine and subalpine, in wet rocky areas, amongst moss mats and along streamlets; 10,000–12,000'; north-central and southwestern Colorado; Boulder, Clear Creek, Garfield, Larimer, Grand, Park, San Juan, and Summit counties.	No	Species Analyzed
Harrington penstemon <i>Penstemon harringtonii</i>	Sagebrush communities, often on calcareous substrates; 6,800–9,000'; endemic to Eagle, Garfield, Grand, Pitkin, Routt, and Summit counties.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
<b>Porter's false needlegrass</b> <i>Ptilagrostis porteri</i>	Hummocks in fens and willow carrs; 9,350–12,000'; El Paso, Lake, Park and Summit counties. Also, n. New Mexico.	No	Species Analyzed
<b>Ice cold buttercup</b> <i>Ranunculus karelinii</i>	Alpine slopes among rocks and scree; 12,000–14,100'; central Colorado, including Chaffee, Clear Creek, Gunnison, Hinsdale, Lake, Ouray, Park and Summit counties.	No	Species Analyzed
<b>Dwarf raspberry</b> <i>Rubus arcticus</i> subsp. <i>acaulis</i>	Wetlands in willow carrs and mossy streambanks; 7,000–9,720'; Clear Creek, Grand and Park counties.	No	Species Analyzed
<b>Silver willow</b> <i>Salix candida</i>	Often associated, but not restricted to rich and extremely rich fens; 8,900–10,400'; Lake, Larimer and Park counties.	No	Species Analyzed
<b>Autumn willow</b> <i>Salix serissima</i>	Wetland areas including marshes, fens, and bogs; 7,800–10,200'; Boulder, Custer, La Plata, Larimer, Park and Routt counties.	No	Species Analyzed
<b>Narrowleaf sphagnum</b> <i>Sphagnum angustifolium</i>	Acidic fens with high concentrations of iron and other ions. San Juan and Gunnison National Forests.	No	Species Analyzed
<b>Baltic sphagnum</b> <i>Sphagnum balticum</i>	Acidic fens with high concentrations of iron and other ions. San Juan National Forest.	No	Species Analyzed

**Table 3F-2:  
R2 Sensitive Plant Species**

<b>Name (Common Name, Scientific Name)</b>	<b>General Habitat and Colorado Range</b>	<b>Species Excluded from Analysis?</b>	<b>Rationale</b>
Sun-loving meadowrue <i>Thalictrum heliophilum</i>	Endemic to sparsely vegetated steep shale talus slopes of the Green River Formation; 6,300–8,800’.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Lesser bladderwort <i>Utricularia minor</i>	Shallow water of subalpine ponds; 8,200–>10,000’ in Colorado; Boulder, Delta, Gilpin, Jackson, La Plata, Larimer, Montezuma and Park counties.	No	Species Analyzed
American cranberry bush <i>Viburnum opulus</i> var. <i>americanum</i>	Riparian and riparian transition to cottonwood, river birch and hawthorn. 6,000–7,000’.	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities

*Notes:*

Narrowleaf moonwort (*Botrychium lineare*) was removed from the 2015 Sensitive Species List owing to the addition of populations previously attributed to *B. furcatum* and other new populations discovered (Tyler 2015a).

Altai cottongrass (*Eriophorum altaicum* var. *neogaeum*) was removed from the 2015 Sensitive Species List due to an on-going taxonomic dispute and there is insufficient information to determine if there is a population viability concern.

### **Species of Local Concern**

SOLC are species suspected to be at risk at a forest-wide scale, but do not meet criteria to be classified as R2 sensitive species because their populations are reasonably secure or stable within portions of R2 of the Forest Service. Eighty-one SOLC plants are documented as occurring on or within 1 mile of the WRNF (the complete list is in the project file). These plants were included in the botanical surveys conducted in 2013.

### **Species of Viability Concern**

A total of 12 plant SIVC are designated in the 2002 Forest Plan (Table 3F-3). Forest-wide standards require surveys for these SIVC and require projects to avoid disturbances that would significantly affect species viability or trend the species towards federal listing. Of the 12 species listed, two are federally threatened, nine are Forest Service sensitive, and one is a SOLC (the complete list is in the project file).

### **Noxious Weeds**

Two species of Colorado Noxious Weeds were documented within the Analysis Area. These include Canada thistle (*Cirsium arvense*) and scentless chamomile (*Matricaria perforata*). In general, weeds are

in low abundance and occur in and around the base area. One additional plant, reed canarygrass (*Phalaris arundinacea*), which is not a noxious weed but is considered invasive, was observed at the North Fork Snake River just above the existing snowmaking storage reservoir.

### **Spruce Beetle**

Spruce bark beetle (*Dendroctonus rufipennis*) poses an increasing concern for the health of spruce forests throughout the Rocky Mountains, including Colorado and the WRNF.<sup>73</sup> Spruce bark beetles typically colonize downed spruce and then spread to standing trees.<sup>74</sup> Therefore, proper care and treatment of downed spruce is an important component of managing this insect. Outbreaks cause extensive tree mortality and can alter stand structure and composition, which can impact scenic resources and create fire hazards.<sup>75</sup> The recent Mountain Pine Beetle epidemic in the area has already significantly changed the scenery in the region and the extensive dead and downed trees pose a fire hazard. Careful attention to the prevention of a spruce beetle outbreak is a primary goal on the WRNF.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

The following discussion summarizes the direct, indirect and cumulative effects of the No Action Alternative and the Proposed Action on the 24 R2 sensitive species carried forward in this analysis, plants classified as SOLC, and noxious weeds. Determinations for all R2 sensitive species are located in the project file.

Since no habitat exists in the Project Area for threatened, endangered, or SIVC plant species they will not be discussed in terms of direct, indirect, and cumulative effects. Neither alternative would have an effect on threatened, endangered, or SIVC plants as none of these plants occur within the Analysis Area.

### **Alternative 1 – No Action**

Under the No Action Alternative, there would be a continuation of existing management practices. There would be no new ski terrain, no new or upgraded ski lifts, and no new multi-season recreation facilities; therefore, there would be no change in vegetative communities. Other previously approved but not-yet-implemented projects would also likely occur, but these projects have already undergone site-specific analysis and approval under NEPA.

### ***Vegetative Communities***

Under the No Action Alternative, there would be a continuation of existing management practices; therefore, there would be no direct or indirect impacts to vegetative communities.

---

<sup>73</sup> USDA Forest Service, 2010

<sup>74</sup> Ibid.

<sup>75</sup> Ibid.

### *R2 Sensitive Species*

A determination of “no impact” was made for all 24 R2 sensitive plant species carried forward into the analysis for Alternative 1. Twenty-two of these species are not known to occur and were not found during the 2013 botanical surveys and, therefore, are presumed to be absent. A determination of “no impact” was also made for the two *Botrychium* spp. carried forward into the analysis for Alternative 1. These include *Botrychium ascendens* and *B. paradoxum*. Although occurrences of these two *Botrychium* spp. could have been overlooked during surveys, there would be no impacts to these species because no additional activities or ground disturbance would be authorized under Alternative 1.

### *Species of Local Concern*

Under the No Action Alternative, there would be a continuation of existing management practices; therefore, there would be no direct or indirect impacts to SOLC. The No Action Alternative is not expected to compromise the long-term viability of these plant species within the planning area or range-wide.

### *Noxious Weeds*

Under the No Action Alternative, there would be a continuation of existing management practices to control the presence of noxious weeds.

### *Spruce Beetle*

No spruce trees would be cut as a result of the No Action Alternative; therefore, there would be no direct impact to the risk of spruce beetle infestation. Natural processes related to this insect are anticipated to continue.

## **Alternative 2 – Proposed Action**

### *Vegetative Communities*

Alternative 2 would require overstory vegetation removal for the construction of Trails B-2 and B-4, removal of approximately 20 to 25 percent of tree basal area for Trails B-1 and B-3, and removal of approximately 15 to 20 percent of tree basal area along the tree skiing centerlines in areas A, B, and C. Overstory vegetation removal would occur in spruce-fir stands. Table 3F-3 summarizes the total area of vegetative communities that would be impacted by the proposed projects.

**Table 3F-3:  
Disturbance by Vegetation Type – Alternative 2**

Vegetation Type	Acres of Disturbance		
	Vegetation Clearing	Tree Skiing	Total
Spruce-Fir	22	44	66
Forb	2	4	6
Grass	0	<1	<1

*Note:* Tree Skiing would result in the removal of approximately 15 to 25% of tree basal area within this overall area.

### *R2 Sensitive Species*

A determination of “no impact” was made for 22 of the 24 plant species carried forward into the analysis for Alternative 2. None of these species are known to occur or were documented during the botanical survey work of 2013. Thus, these species are presumed to be absent.

For the two Forest Service sensitive moonwort species, no occurrences were found during the surveys that were focused in areas that would be directly impacted under Alternative 2. Therefore, it is unlikely that there would be any direct effects to these species. However, because occurrences of *Botrychium* spp. could have been overlooked due to their small size and phenological development, there is a remote possibility that they could be present and of direct and/or indirect effects. Direct impacts could potentially result from trampling, breaking, crushing, or uprooting of individuals as produced by machinery during the construction process for lift tower installation or removal. Individuals could also be directly impacted by smothering with slash, chips, or soil, and could also have trees fall on them during forest overstory removal. Individuals impacted may die or experience reduced growth and development as well as reduced or eliminated seed-set and reproduction. If direct impacts are large enough, the reduced population size may change meta-population structure, potentially affecting species viability on the planning unit or rangewide.

Indirect effects to *Botrychium* spp. could also occur as a result of the Proposed Action. Increased light regime from forest overstory removal and creation of skid trails or access routes could potentially benefit moonworts in the long run by creating open, disturbed sites that these plants prefer. Other indirect impacts, such as noxious weed invasion, altered hydrologic patterns, or increased dust from vehicular construction traffic may be a detriment to *Botrychium* spp., and impacted individuals may die or show reduced growth and reproduction. However, over time, disturbances related to the Proposed Action would stabilize and create additional habitat for moonworts, which would benefit these species as a whole. In addition, PDC would be implemented in order to lessen the magnitude of any potential direct and/or indirect effects.

It is anticipated that the direct and indirect impacts associated with Alternative 2 would be localized and not of sufficient intensity or scale to cause a significant effect. A determination of “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing (MAII)” was made for two *Botrychium* spp. (*Botrychium ascendens* and *B. paradoxum*), due to the remote possibility that the species could occur in the Analysis Area.

**Table 3F-4:**  
**Summary of Potentially Affected R2 Sensitive Plant Species**

Species Name (Common Name, <i>Scientific Name</i> )	Determination	Rationale
Upswept moonwort <i>Botrychium ascendens</i>	MAII	Despite no known occurrences or documented new occurrences, it is possible that populations of this genus may exist yet go undetected during survey efforts.
Paradox moonwort <i>Botrychium paradoxum</i>	MAII	Despite no known occurrences or documented new occurrences, it is possible that populations of this genus may exist yet go undetected during survey efforts.

### *Species of Local Concern*

Under the Proposed Action there would be no direct impacts to *Carex gynocrates*, or the high quality wetland fen it occupies. However, there would be direct adverse impacts to the other nine SOLC and their habitats. Overall, the Proposed Action would impact 9 percent of occupied SOLC habitat (Table 3F-5).

Indirect impacts to plant SOLC could include changes in vegetation composition, such as the removal of a forest overstory leading to increased light regime, introducing non-native and weed seeds, the creation of habitat for and introduction of invasive plant species, altering hydrologic patterns, increased soil erosion or sedimentation, and increased snow compaction. While many of these indirect impacts have the potential to negatively affect plant species, with proper PDC, it is anticipated that these effects would be relatively minor and not of sufficient scale or intensity to compromise the viability of these SOLC range-wide. In addition, some indirect effects could potentially benefit some SOLC such as *Botrychium* spp. For example, increased light regime from forest overstory removal and creation of recreation facilities could potentially benefit moonworts in the long run by creating open, disturbed sites that these plants prefer.

**Table 3F-5:**  
**Impact Summary for SOLC under Alternative 2**

Species (Common Name, <i>Scientific Name</i> )	Impact/Total Area (acres)	Percent Impact
Dwarf columbine ( <i>Aquilegia saximontana</i> )	0.014/0.088	16%
Moonworts ( <i>Botrychium</i> spp.) <sup>a</sup>	0.097/0.199	48% <sup>b</sup>
Northern Bog Sedge ( <i>Carex gynocrates</i> )	0/0.007	0%
Snowlover ( <i>Chionophila jamesii</i> )	0.285/1.894	15%
Thickleaf draba ( <i>Draba crassa</i> )	0.009/0.548	2%
Showy draba ( <i>Draba spectabilis</i> )	0.007/0.049	14%
Stiff clubmoss ( <i>Lycopodium annotinum</i> )	0.249/4.201	6%
<b>TOTAL</b>	<b>0.660/6.986</b>	<b>9%</b>

Notes:

<sup>a</sup> Includes *Botrychium echo*, *B. lanceolatum* (red-stem form), *B. minganense*, and *B. neolunaria*

<sup>b</sup> Although 48% of the occupied moonwort habitat may be impacted, only 27% of the individuals would be impacted.

### *Noxious Weeds*

Noxious weed invasions often occur where habitats are disturbed. If a noxious weed invasion occurs within occupied habitat, individuals or whole populations of moonwort species could be lost as a result of the change in plant community and resulting competition. PDC that require machinery cleaning before use on NFS lands would eliminate the transport of weed/invasive species seeds from off-site.

### *Spruce Beetle*

Spruce trees would be cut for ski trails and tree skiing areas under Alternative 2. The implementation of PDC listed in Table 2-2 would ensure that downed spruce trees are properly treated (or promptly removed or burned) to prevent colonization by spruce beetles. These PDC would minimize the risk that tree removal would contribute to a spruce beetle outbreak.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of botanical and vegetation resources extends from A-Basin's inception as a ski area in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of botanical and vegetation resources are limited to the Analysis Area which encompasses the front side of the existing ski area as well as the Beavers Bowl and undeveloped areas within the Forest Service SUP boundary.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on vegetation and botany resources and are analyzed below:

- A-Basin MDP Update
- Keystone Resort Dercum Mountain Improvements Projects EA
- Keystone Resort MDP
- 2011 Keystone Ski Area Forest Health Project
- WRNF Forest Plan – 2002 Revision

For Alternative 2, there is a remote possibility of cumulative effects to the moonwort species, especially because the rarity of *Botrychium ascendens* and *B. paradoxum* make them extremely vulnerable to extirpation. Assuming presence of the above listed species, past actions likely had both positive and negative effects on *Botrychium* spp. Historic activities within the Analysis Area, such as ski trail development and forest thinning that reduced forest cover while minimizing ground disturbance and soil sterilization, likely benefitted moonworts by creating open habitats preferred by these species. However, introduction of invasive species, infrastructure development (e.g., buildings, lift tower foundations) and creation of new roads and trails may have been detrimental to moonworts by increasing competition for light, causing erosion and sedimentation, and eradicating habitat. Present and future projects would likely cause similar effects to those in the past, and the actions and effects described above can be additive. Forest Plan standards mandate that, “Activities will be managed to avoid disturbance to sensitive species that would result in a trend toward federal listing or loss of viability.” Thus, cumulative effects are not expected to contribute to increases in any current, or predicted, downward trend in sensitive plant species population numbers, extent, or habitat across the planning unit.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

No irreversible and/or irretrievable commitment of vegetation resources has been identified in association with either alternative analyzed in this document.

## **G. WILDLIFE AND AQUATIC RESOURCES**

### **SCOPE OF THE ANALYSIS**

This wildlife analysis is tiered to the 2002 WRNF Forest Plan FEIS, and incorporates by reference the 2002 Forest Plan, as amended, as well as the Southern Rockies Lynx Management Direction Record of Decision (SRLMD).<sup>76</sup> Species analyzed were identified as listed proposed, TES or MIS. A Biological Assessment (BA)/Biological Evaluation (BE)/MIS/Migratory Bird Report has been prepared and is in the project file.<sup>77</sup> All of these documents are hereby incorporated by reference and summarized below. Refer to the Affected Environment portion of Chapter 3, Section 3 – Vegetation and Botany for the project setting and vegetation types. The spatial scope of the wildlife analysis primarily includes the A-Basin’s SUP area, but it also extends to areas beyond the SUP area that could be impacted from a wildlife movement standpoint.

### **AFFECTED ENVIRONMENT**

#### **Threatened and Endangered Species**

Federal threatened and endangered species for the WRNF are displayed in Table 3G-1. Other listed and proposed species known to occur elsewhere on the WRNF or in Colorado were considered but dropped

---

<sup>76</sup> USDA Forest Service, 2002b and 2008b

<sup>77</sup> Western Ecosystems, Inc., 2015

from detailed analysis because their habitats do not occur on the Dillon Ranger District, they have no affinity to Project Area habitats, and/or the Project Area is outside of the species' range. A pre-field review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements, and determine whether field reconnaissance was needed to complete the analysis. No further analysis is needed for species that are not known or suspected to occur in the Project Area, and for which no suitable habitat is present. The following table documents the rationale for excluding a species.

**Table 3G-1:  
Threatened, Endangered, and Proposed Wildlife Species**

Common and Scientific Name	Status	Rationale for Occurrence (Habitat)/ Carried Forward in Analysis
Humpback chub, <i>Gila cypha</i>	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / YES
Bonytail chub, <i>G. elegans</i>	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / YES
Colorado pikeminnow, <i>Ptychocheilus lucius</i>	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / YES
Razorback sucker, <i>Xyrauchen texanus</i>	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / YES
Greenback cutthroat trout, <i>Oncorhynchus clarkii stomias</i>	FT	Habitat occupied by non-native fish. Outside of historical range (isolated mountain stream headwaters) / NO
Canada lynx, <i>Lynx canadensis</i>	FT	Present in Analysis Area, potential forage/travel habitat (montane and subalpine forests) / YES

Source: Western Ecosystems, Inc., 2015

Notes:

Federal status, listed after species, is as follows: FE = Federally Endangered, FT = Federally Threatened

### ***Big River Fish***

Humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker are not known to occur on the WRNF or any closer to the Project Area than the mainstem of the Colorado River near Rifle.<sup>78</sup> These four big river fish are addressed together because they all occur far downstream from the Project Area in the upper Colorado River basin (i.e., the action area) and because water depletions, water quality degradation, and the effects of impoundments have been the major factors adversely affecting these species. The USFWS has determined that activities resulting in water depletion in the Upper Colorado River Basin may jeopardize the continued existence of the four endangered fish. Section 7 of the ESA mandates that actions authorized, funded, or implemented by a federal agency will not likely jeopardize the continued existence of a listed endangered or threatened species or result in the destruction or adverse

---

<sup>78</sup> USFWS, 1999

modification of critical habitat. Existing water use, water rights and Section 7 consultation is detailed in the technical report found in the project file.

### *Canada Lynx*

Preliminary data from lynx monitored in the vicinity of Summit and Eagle County ski areas suggest that lynx approach ski areas' operational boundaries, but may not be using ski areas during daylight hours during the winter operating season.<sup>79</sup> However, lynx may use ski areas at night and during summer months when recreational activities have ceased.

Habitat connectivity associated with daily, breeding season, and landscape-level movements through ski areas is somewhat degraded during the ski season by a combination of habitat fragmentation (developed ski terrain), skier presence and activity during operating hours, a reduced prey base, and Mountain Pine Beetle effects (where lodgepole pine is present).

In addition to the habitat loss and fragmentation associated with developed ski terrain, the presence of skiers within and adjacent to active terrain (i.e., including undeveloped tree skiing areas) has likely degraded the inherent value of lynx habitat as foraging and security areas. However, because of habitat loss and fragmentation and the subsequent negative effects of winter skiing activity (e.g., snow compaction, increased predator/competitor presence, reduced hare habitat effectiveness, etc.), snowshoe hare presence is often reduced and may eventually be eliminated in at least some areas year-round due to ski area development.<sup>80</sup> Therefore, the USFWS has concluded that although high quality lynx habitat may occur adjacent to ski trails, its functionality is likely degraded by the winter elimination of hares due to human intrusion and disturbance into the habitat.

### Lynx Use of Southern Summit County and A-Basin

A number of specific lynx relocations and observations of lynx moving through southern Summit County became public when the Colorado Parks and Wildlife (CPW) was actively tracking lynx. Focusing on A-Basin, some of these lynx movements involved multiple relocations/observations of individual lynx over a week or two as they moved through southern Summit County and apparently through the Loveland Pass Lynx Linkage. Although most of the presumed movements over Loveland Pass were based on relocations east and west of the pass and the assumption that a lynx moving between those two points would move through continuous forest cover (which would have taken it through A-Basin), there were lynx relocations made within the Loveland Pass Lynx Linkage and a lynx was observed on developed A-Basin ski terrain.<sup>81</sup> Since then, numerous relocations of radio-collared lynx have been made in the Loveland Pass Lynx Linkage. It does not appear that any of the 1999–2006 relocations in the vicinity of A-Basin were those of lynx within a home range; all are presumed to be those associated with dispersing and breeding

---

<sup>79</sup> Roberts, 2015

<sup>80</sup> USFWS, 2013

<sup>81</sup> In October, during daylight hours, outside the ski season, at treeline below the West Wall.

season movements. Home ranges for potential future resident lynx do exist within Summit County and the proposed Project Area.

#### Existing Lynx Habitat within A-Basin SUP Area

Table 3G-2 presents lynx habitat types and acres within the SUP area. As described in the following table, the A-Basin SUP area includes high quality lynx habitat, including winter foraging and denning habitat.

**Table 3G-2:**  
**Lynx Habitat in the A-Basin SUP Area**

<b>Lynx Habitat Description</b>	<b>Acres of Habitat</b>	<b>% of all Lynx Habitat</b>
Winter Foraging	299.9	16
Denning	433.3	24
Other	88.5	5
Currently Unsuitable	0	0
<i>Total Lynx Habitat</i>	<i>821.7</i>	<i>45</i>
Non-habitat	999.7	54
Private	22.1	1
<b>TOTAL CLASSIFIED HABITAT</b>	<b>1,843.5</b>	<b>100</b>

*Source: SE Group, 2015*

#### Existing Skier Use of the Beavers

Currently, the Beavers can be accessed legally through backcountry access points located along the western extent of A-Basin's operational boundary. Terrain beyond these access points is unmaintained and A-Basin does not open or close these access points. From these points, skiers may exit the controlled/patrolled portions of A-Basin's operational boundary to access adjacent backcountry terrain in the Beavers, the Steep Gullies (both within the SUP area), and the Rock Pile (outside the SUP area). These areas receive heavy backcountry use by the public once the snowpack is sufficient. After the terrain is skied, most skiers congregate into two unofficial egress trails across the North Fork Snake River and climb back to the highway where they hitchhike back to the ski area.

To better understand potential effects of the Proposed Action on lynx and project consistency with the SRLMD, a three-year monitoring plan was implemented during the 2011/12 to 2013/14 ski seasons to quantify existing amounts and distributions of skiing in A-Basin's forested backcountry. The study performed for this analysis indicates that backcountry use in the Beavers totaled approximately 2,324 total skiers (approximately 6 skiers per day) during the 2011/12 season, approximately 16,640 total skiers (approximately 29 skiers per day) during the 2012/13 season, and approximately 13,291 total skiers (approximately 20 skiers per day) during the 2013/14 season.<sup>82</sup> The report detailing the study is contained in the project file.

---

<sup>82</sup> Thompson, 2014

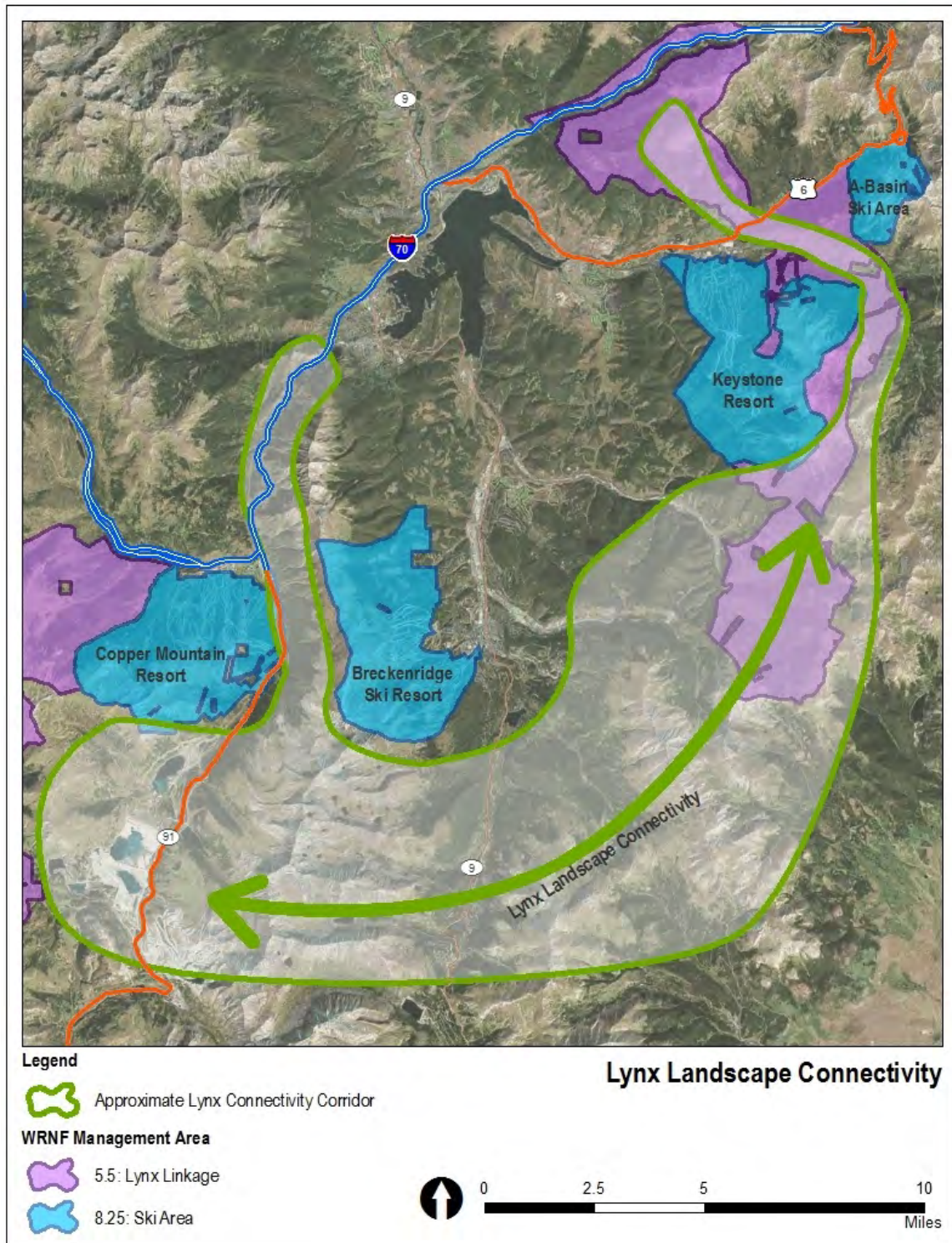
#### Landscape Connectivity in Southern Summit County and A-Basin

Because of the patchy, discontinuous distribution of lynx habitat in Colorado, maintaining landscape-level habitat connectivity may be paramount to maintaining a viable population. Colorado lynx habitats are not only constrained by broad alpine zones and non-forested valleys, but also by towns, reservoirs, highways, and other human developments that fragment and isolate montane and subalpine lynx habitats. Any continuously forested corridor between mountain ranges supporting lynx habitat that is relatively free of human development has the potential to be an important landscape linkage.

Southern Summit County, which includes the A-Basin Project Area, is relatively well-connected with forested habitats in adjacent mountain ranges to the south and west, which are the main sources of lynx entering the County via dispersal from the two Core Areas (the San Juans and Taylor Park). Based on habitat characteristics and early lynx use and more recent lynx relocations and lynx use area analyses, a corridor of nearly continuous, undeveloped forest facilitating lynx movements was identified extending through southern Summit County. Although I-70 may represent a restriction and mortality source, it is not a barrier for northbound lynx dispersing through this eastern landscape linkage.

Map 3G-1 illustrates lynx connectivity in southern Summit County utilizing primarily forested habitats.

Map 3G-1:  
Lynx Landscape Connectivity in Southern Summit County



Three types of lynx movements are being considered in this analysis with respect to habitat connectivity, all of which must be maintained at the project level for an action to be considered consistent with the ALL S1 Standard of the SRLMD.

1. Landscape-level movements: Landscape-level movements are the most extensive and concerted of lynx movements. Such movements are not necessarily confined to primary or secondary lynx habitat and few obstacles in any landscape stop this movement type.
2. Breeding season movements: Breeding season movements can also be extensive, concerted, and are diverted by few obstacles, but these movements generally occur within forested lynx habitat.
3. Daily movements: Daily movements within a home range are the shortest, involve hunting, and are generally confined to the highest quality habitat. These movements are most sensitive to fragmented, low quality habitat, and incompatible land uses.

#### Project Area Habitat Connectivity

The portion of A-Basin's SUP area that is located in the North Fork Snake River drainage overlaps the designated Loveland Pass Lynx Linkage. This overlap includes the entire north-facing, front side of the existing developed ski area and all terrain (the most effective of which is below treeline) that would be developed for the Beavers.

The Beavers' below treeline terrain facilitates lynx movements. Between the highway and treeline, this forested corridor is 0.44 to 0.78 mile wide. It is almost entirely and continuously forested, intact, and supports a relatively flat terrace sloping down to the North Fork Snake River. The forested Beavers terrain is intact habitat. It physically facilitates lynx movements at all times throughout the year, particularly the continuous terrace south of the North Fork Snake River. However, it is likely that the effectiveness of that habitat for conducting all three types of lynx movements may be impaired to some unknown extent by existing levels of winter ski activity. Excluding adjacent potential traffic influences and ski activity on A-Basin's developed ski terrain, there are no other meaningful human activities that could affect baseline lynx movements through this area. Skier use of A-Basin's developed ski terrain starts earlier (usually in October) and ends later (usually in May–June) than in the Beavers. Despite this skier use, all lynx that have moved through A-Basin and this portion of the Loveland Pass Lynx Linkage have done so with the seasonal skier use of A-Basin's developed terrain, the Beavers, and the Rock Pile beyond. Thus, there is currently some level of lynx habitat connectivity through A-Basin's developed and undeveloped terrain.

#### R2 Sensitive Species

Based on documented habitat affinities, the species highlighted in bold in Table 3G-3 below were determined to have potential habitat in the Project Area. Sensitive species for which there is no habitat in the Project Area would not be impacted and were eliminated from further analysis. Additional

information regarding species with potential habitat present (e.g., boreal toad) can be found in the technical report in the project file.

**Table 3G-3:  
R2 Sensitive Species**

<b>Common name, <i>Scientific name</i></b>	<b>Rationale for Potential Project Effects (Habitat Affinity)</b>
<b>INSECTS</b>	
<b>Western bumblebee</b> , <i>Bombus occidentalis</i>	Potential Habitat (montane and subalpine meadows)
Great Basin silverspot, <i>Speyeria nokomis</i>	No habitat (wetlands supporting violet populations)
Monarch butterfly, <i>Danaus plexippus plexippus</i>	No host plant habitat (milkweed)
<b>FISH</b>	
Roundtail chub, <i>Gila robusta robusta</i>	No suitable habitat (Colorado River up through Glenwood Canyon)
Mountain sucker, <i>Catostomus platyrhynchus</i>	No suitable habitat (small to medium streams below 7000'; 4 populations documented on the Rifle and Blanco districts)
Bluehead sucker, <i>Catostomus discobolus</i>	No suitable habitat (Colorado River up to Alkali Creek)
Flannelmouth sucker, <i>Catostomus latipinnis</i>	No suitable habitat (Colorado River & larger tributaries)
<b>Colorado River cutthroat trout</b> , <i>Oncorhynchus pleuriticus</i>	Historic and potential habitat (isolated, headwater streams & lakes)
<b>AMPHIBIANS</b>	
<b>Boreal western toad</b> , <i>Anaxyrus boreas boreas</i>	Present: historic breeding habitat (montane/subalpine ponds with willow wetlands)
<b>Northern leopard frog</b> , <i>Lithobates pipiens</i>	Outside Range (permanent wetlands)
<b>BIRDS</b>	
<b>Northern goshawk</b> , <i>Accipiter gentilis</i>	Potential Habitat (closed montane forests >7,500')
Northern harrier, <i>Circus cyaneus</i>	No habitat (grasslands, agricultural lands, marshes, & alpine)
Ferruginous hawk, <i>Buteo regalis</i>	No habitat (plains, grasslands)
<b>American peregrine falcon</b> , <i>Falco peregrinus anatum</i>	Potential Habitat (cliffs, habitats concentrating/exposing vulnerable prey)
Bald eagle, <i>Haliaeetus leucocephalus</i>	No habitat (open water bodies, big game winter range)
<b>White-tailed ptarmigan</b> , <i>Lagopus leucurus</i>	Present (alpine habitat and upper elevation willow stands)
Greater sage grouse, <i>Centrocercus urophasianus</i>	No habitat (sagebrush)
Columbian sharp-tailed grouse, <i>Tympanuchus phasianellus columbianus</i>	No habitat (sagebrush & mountain shrub)
Flammulated owl, <i>Otus flammeolus</i>	No habitat (old-growth ponderosa pine & aspen)
<b>Boreal owl</b> , <i>Aegolius funereus</i>	Present (mature spruce-fir & mixed conifer)
Black swift, <i>Cypseloides niger</i>	No local nesting habitat (waterfalls, cliffs)
Lewis' woodpecker, <i>Melanerpes lewis</i>	No habitat (ponderosa pine & cottonwoods)
<b>Olive-sided flycatcher</b> , <i>Contopus cooperi</i>	Present (open, upper elevation conifer forests)
Loggerhead shrike, <i>Lanius ludovicianus</i>	No habitat (plains, low valleys, shrublands)
Purple martin, <i>Progne subis</i>	No habitat (old-growth aspen)
Brewer's sparrow, <i>Spizella breweri</i>	No habitat (sagebrush & other structurally similar shrublands)
Sage sparrow, <i>Amphispiza belli</i>	No habitat (low elevation big sagebrush & sage/greasewood)

**Table 3G-3:  
R2 Sensitive Species**

Common name, <i>Scientific name</i>	Rationale for Potential Project Effects (Habitat Affinity)
<b>MAMMALS</b>	
<b>Pygmy shrew</b> , <i>Microsorex hoyi montanus</i>	Potential Habitat (variety of subalpine habitats)
Fringed myotis, <i>Myotis thysanodes</i>	No habitat (forests/woodlands to 7,500'; unknown on WRNF)
Hoary bat <i>Lasiurus cinereus</i>	No habitat (forests up to mixed conifer & lodgepole pine)
Spotted bat, <i>Euderma maculatum</i>	No habitat (cliffs, arid terrain)
Townsend's big-eared bat, <i>Corynorhinus townsendii</i>	No habitat (structures, tree cavities <9,500')
<b>American marten</b> , <i>Martes americana</i>	Present (conifer forests)
<b>North American wolverine</b> , <i>Gulo gulo luscus</i>	Potential Travel habitat (mountains)
River otter, <i>Lontra canadensis</i>	No habitat (year-round open water & stream flows of $\geq 10$ cfs)
<b>Rocky Mountain bighorn sheep</b> , <i>Ovis canadensis</i>	Present (high visibility habitat near escape terrain)

Sources: USDA Forest Service, 2015 and Western Ecosystems, Inc., 2016

### **Management Indicator Species**

MIS are selected to determine how management actions are affecting wildlife resources (refer to Table 3G-4). Each species was chosen to answer specific questions about how these species use habitat and how habitat alterations through management decisions could affect the species. Species were selected based on the species reaction to changes in habitat and the ability to monitor the changes in the species populations or habitat use.

**Table 3G-4:  
Management Indicator Species**

MIS Species	Habitat Occupied by Species? Are species and habitat present in the Analysis Area?	Will Proposed Action affect (direct, indirect, or cumulative) the species or its habitat?
<b>Elk</b>	Wide range of forest and non-forest habitats <i>Species Presence: Yes</i> <i>Habitat Presence: Yes</i>	<i>Species – Proposed Action: Yes</i> <i>Habitat – Proposed Action: Yes</i>
Cave Bats	Caves, abandoned mines <i>Species Presence: No</i> <i>Habitat Presence: No</i>	<i>Species – No Action &amp; Proposed Action: No</i> <i>Habitat – No Action &amp; Proposed Action: No</i> Project will not affect any cave resources or this species group.
<b>American Pipit</b>	Alpine Grassland <i>Species Presence: Yes</i> <i>Habitat Presence: Yes</i>	<i>Species – Proposed Action: Yes</i> <i>Habitat – Proposed Action: Yes</i>
Brewer's Sparrow	Sagebrush <i>Species Presence: No</i> <i>Habitat Presence: No</i>	<i>Species – No Action &amp; Proposed Action: No</i> <i>Habitat – No Action &amp; Proposed Action: No</i> Project would not affect sagebrush habitats or this species.

**Table 3G-4:  
Management Indicator Species**

<b>MIS Species</b>	<b>Habitat Occupied by Species? Are species and habitat present in the Analysis Area?</b>	<b>Will Proposed Action affect (direct, indirect, or cumulative) the species or its habitat?</b>
Virginia's Warbler	Dense Shrub Habitats <i>Species Presence:</i> No <i>Habitat Presence:</i> No	<i>Species – No Action &amp; Proposed Action:</i> No <i>Habitat – No Action &amp; Proposed Action:</i> No Project would not affect shrub habitat types or this species.
<b>Aquatic Macroinvertebrates</b>	Perennial streams, intermittent streams, lakes and reservoirs <i>Species Presence:</i> Yes <i>Habitat Presence:</i> Yes	<i>Species – Proposed Action:</i> Yes <i>Habitat – Proposed Action:</i> Yes
<b>All Trout (brook, brown, rainbow, CR cutthroat)</b>	Perennial streams and lakes <i>Species Presence:</i> Yes <i>Habitat Presence:</i> Yes	<i>Species – Proposed Action:</i> Yes <i>Habitat – Proposed Action:</i> Yes

### **Migratory Birds**

In 2008 the Forest Service Chief signed a Memorandum of Understanding (MOU) with the USFWS to promote the conservation of migratory birds. This MOU was pursuant to EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds.<sup>83</sup> The EO directs agencies to take certain actions to further comply with the migratory bird conventions, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act and other pertinent statutes. The purpose of the MOU is to strengthen migratory bird conservation by identifying strategies that promote conservation and avoid or minimize negative impacts on migratory birds.

Table 3G-5 presents a list of birds of conservation concern, as well as information about potential occurrence in the Analysis Area.

**Table 3G-5:  
USFWS Birds of Conservation Concern**

<b>Species</b>	<b>General Habitat</b>	<b>Occurrence in Analysis Area</b>
Northern Harrier	Grasslands	No
Swainson's Hawk	Grasslands	No
Ferruginous Hawk	Prairie	No
Golden Eagle	Cliffs/grasslands	Yes, project area could be part of large hunting range; no local nests
Peregrine Falcon	Cliffs	Yes, project area may be part of large hunting range; one "local" eyrie
Prairie Falcon	Cliffs	No
Gunnison sage-grouse	Sagebrush	No
Snowy Plover	Shorelines	No
Mountain Plover	Prairie	No
Solitary Sandpiper	Shorelines	No

<sup>83</sup> 66 Federal Register 3853, 2001

**Table 3G-5:  
USFWS Birds of Conservation Concern**

Species	General Habitat	Occurrence in Analysis Area
Marbled Godwit	Wetlands	No
Wilson's Phalarope	Waterbodies/Shorelines	No
Yellow-billed Cuckoo	Deciduous Riparian	No
Flammulated Owl	Ponderosa pine/snags	No
Burrowing Owl	Plains/grasslands	No
Short-eared Owl	Parks/grasslands	No
Black Swift	Waterfalls/wet cliffs	No
Lewis's Woodpecker	Riparian Cottonwood	No
Williamson's Sapsucker	Montane forests/snags	No
Gray Vireo	Oak woodlands/scrub	No
Pinyon Jay	Pinyon/Juniper	No
Bendire's Thrasher	Rare spp of arid areas	No
Crissal Thrasher	No records in CO	No
Sprague's pipit	No records in CO	No
Virginia's warbler	Riparian scrub	No
Black-throated gray warbler	Oak scrub/riparian	No
Grace's warbler	Ponderosa pine	No
Sage sparrow	Sagebrush	No
Chestnut-collared longspur	Plains	No

Other migratory birds are considered individually in this section as listed species, R2 sensitive species, and MIS. More detailed information on the habitat requirements, status, distribution, abundance, and key habitat components of most species is on file at the Forest Service Supervisor's Office in Glenwood Springs, Colorado, and the USFWS's Western Colorado Field Office in Grand Junction, Colorado, and is not reviewed here.

### **CPW Threatened and Endangered Species**

The current lists of Colorado threatened and endangered species and species of state special concern was considered for species that may occur on and around the Project Area. Those lists included two mollusks, 23 fish, seven amphibians, ten reptiles, 19 birds, and 13 mammals. None of those listed state species occur or have potential habitat that would be influenced by the Proposed Action, or the species have been addressed above as part of other species lists. Boreal western toad is a state listed species and is addressed in this analysis as a R2 Sensitive Species. The remaining species are not considered further in this analysis.

### **Species of Local Concern**

Animal SOLC addressed in this section are those identified from CPW's and the public's responses to the scoping notice, unless otherwise noted. The Forest Service Project Biologist selected those species that

are not on other lists associated with this analysis and that were of greater public concern warranting individual consideration.

### *Mule Deer*

The entire A-Basin Project Area, the area west of the Continental Divide, and the area north of Montezuma Road and Highway 6 to I-70 (and other surrounding areas) are mapped as mule deer overall range and summer range. The closest deer winter range, winter concentration area, and severe winter range habitats are far down the Blue River Valley, north of the Town of Silverthorne. The general migration patterns in the vicinity include an east-west (and vice versa) movement, south of Highway 6 that goes up and over Loveland Pass and a north-south (and vice versa) movement through subalpine and montane forest across the Tenderfoot Mountain habitat block north of Keystone Resort and northeast of the Town of Dillon. A north-south migration corridor extends along approximately 1.5 miles of Montezuma Road beginning at the eastern edge of the Keystone Resort base area.

Mule deer utilize the A-Basin ski area, including the proposed Project Area, throughout summer and fall months. Winter ranges occur further down valley to the north and the general direction of spring migration is up valley, following receding snowlines using similar patterns exhibited by elk. No known fawning (late May to mid-June) has occurred within the Project Area because of the extent of snow cover at the time of fawning. Fawning may occur at the lowest elevations following low snowfall years with early spring melt off. However, deer that fawn at lower elevations in the North Fork Snake River move into the Project Area as snow recedes. Deer occur at all elevations in the Project Area during summer, extending on average from mid- to late-June through late-October. Some deer are somewhat habituated to existing levels of summer maintenance and the low levels of summer recreation.

### *Mountain Goat*

Upper elevations of the Project Area are within mountain goat overall range, summer range, and concentration area. Alternative 2 project components overlapping these ranges include the proposed Zuma Access surface lift, the upper portion of the proposed Beavers chairlift, and the upper portion of Beaver Bowl. A production area extends across the south-facing slopes of Lenawee Mountain overlapping the steep cliff bands within the SUP area (the *Upper East Wall*). The closest goat winter range occurs on Grizzly Peak (approximately 0.65 mile to the east of the SUP area) and extends south along both sides of the Continental Divide. The mountain goat habitat range in A-Basin is part of a migration corridor along the Continental Divide that continues north over the Johnson and Eisenhower Tunnels.

Goats are not present on the ski area during winter. The Lenawee Mountain area is heavily utilized by mountain goat nannies and kids throughout the summer months. The talus rock faces and cliffs provide escape terrain adjacent to alpine meadows and ridge tops, providing summer habitat for rearing kids as well as a movement corridor connecting with surrounding high alpine habitats. Goats are occasionally

displaced by summer maintenance activities associated with facilities at the top of the mountain; however, local goats are somewhat habituated to this periodic disturbance.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

The No Action Alternative reflects a continuation of existing operations and management practices at A-Basin without changes, additions, or upgrades on NFS lands. Alternative 1 would result in no additional water diversions or depletions.

Over the short-term (<50 years), vegetation within the Project Area would remain much the same. The Project Area would continue to provide habitat for species present. Potential disturbance to these species would remain at current levels. Implementation of Alternative 1 would have no impact on threatened, endangered, R2 sensitive species, MIS, migratory birds, CPW species, or SOLC.

### **Alternative 2 – Proposed Action**

#### *Threatened and Endangered Species*

##### **Big River Fish**

Because additional water depletions associated with additional guest service facilities use is within the amount previously consulted upon, Alternative 2 would have “no effect” on the four big river fish.

##### **Canada Lynx**

Alternative 2 would result in collective effects on lynx foraging, sheltering, and breeding that exceed the definitions of insignificant and discountable and further impair an already injured Analysis Area.

Therefore, Alternative 2 warrants a “may affect, likely to adversely affect” determination for Canada lynx. The effects are summarized below. For additional detail, refer to the technical report in the project file.

##### **Lynx Habitat Impacts**

Approximately 314.3 acres of habitat would be disturbed. The majority of this affected habitat does not result in physical modifications but an increase level of altered skiing use (e.g., greater use of Beaver Bowl and “developed” subalpine Beavers terrain). Impact acreages resulting from individual project components are contained in the technical report in the project file. Alternative 2 would impact 162.5 acres of suitable lynx habitat (forested) and 151.8 acres of “non-habitat” (alpine) on NFS lands.

Of the total 314.3 acres disturbed, the Proposed Action would directly affect 63.3 acres of lynx habitat, converting the lynx habitat into 41.9 acres of “other” habitat and 21.4 acres of “non-habitat.” The majority of existing lynx habitat values should be physically retained within the Beavers. Furthermore, most of the habitat affected by Alternative 2 (above and below treeline) would not be physically modified, but it would receive an increased level of skiing.

By itself, the permanent loss of this acreage of undeveloped and generally effective lynx habitat (i.e., at all times throughout the year, except during the day within the winter ski season) in an LAU whose functionality is currently impaired by Mountain Pine Beetle epidemic effects, collective anthropogenic effects, and natural limitations, would result in an adverse effect to lynx. Regarding habitat connectivity, the loss of this home range efficacy would adversely affect daily (intra-home range) and reproductive movements within the Snake River LAU, adjacent LAUs, and the Loveland Pass Lynx Linkage.

Additional skier use resulting from development of the Beavers under Alternative 2 would have significant negative effects on lynx home range efficacy as a result of a reduced prey base and effective habitat availability. Described in great detail in the project file, greater recreational use and tree clearing/thinning (e.g., within the Beavers terrain) could reduce hare abundance by +/- 30 to 40 percent. Hare would likely colonize the habitat down valley as well as resolve to greater dependence on the available habitat adjacent to the emergency egress route and surrounding riparian area (North Fork Snake River) as it would not be used by recreational A-Basin guests, only by ski patrol and for grooming purposes after operating hours. For this reason, the habitat below the emergency egress route within the riparian area adjacent to the river forms the best quality hare habitat in the Beavers terrain.

None of the terrain that would be impacted by Alternative 2 is currently effective as diurnal security habitat.

#### **Habitat Connectivity Impacts**

The three types of lynx movements (landscape-level, breeding season, and daily) are described in the Affected Environment. Additional skier use resulting from development of the Beavers would have significant negative effects on lynx habitat connectivity during the ski season, and the effects to the three movement types are summarized below.

1. Landscape-level movements: Landscape-level movements would be “maintained.” During winter operating hours in the Beavers, this concerted movement type would be further impaired compared to the existing condition by skiing activity, but such concerted movements would continue.
2. Breeding season movements: Breeding season movements would be “maintained.” This movement type would be further impaired due to skier use compared to the existing condition, but such concerted movements would continue.
3. Daily movements: While existing levels of skiing may displace daily (i.e., hunting) lynx movements from Beavers terrain, daily lynx movements and reproductive movements related to home range use would not be “maintained” in Beavers terrain because of greater skiing intensity during the ski season. As noted in the BA, “Intuitively we assume that some threshold exists where human disturbance becomes so intense that it precludes lynx use (at least temporarily) of

otherwise suitable habitat.”<sup>84</sup> The increased skier use in the affected area would essentially decrease the size of a lynx’s home range by “clipping off” the area of discussion. This habitat would no longer be functional for lynx to use for daily movements or reproductive movements during the breeding season. Increased skier use affecting such a large area of forest in most of this movement corridor’s width would further impair already impaired habitat connectivity through developed and undeveloped A-Basin ski terrain and through this local portion of the LAU and Loveland Pass Lynx Linkage during the ski season.

For those guests skiing the Steep Gullies, the emergency egress and hike-back route would collect these guests and direct them to the Pallavicini chairlift. Currently, these guests ski down to the North Fork Snake River and hike to Highway 6 in an effort to hitchhike back to the A-Basin base area. Therefore, the emergency egress and hike-back route would effectively reduce the number of people skiing through this high quality lynx habitat area along the riparian corridor (refer to Figure 2 for a location of the emergency egress and hike-back route in proximity to Highway 6). This element of the project would improve the habitat quality of the area below the emergency egress and hike-back route compared to the existing condition.

Outside the ski season, low levels of localized maintenance activities in the Beavers would still allow for all types of lynx movements to occur. On the developed ski area, the additional summer activities extending from the base area to near treeline could have a negative influence on lynx movements. However, habitat connectivity, home range and breeding movements would still be “maintained” on the developed ski area because human use of the area would be much less intense than during the ski season.

For the following reasons, Alternative 2 would not meet the intent of the “maintain” term in SRLMD ALL S1 Standard, which states: “New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.”<sup>85</sup>

- Of the total 314.3 acres disturbed, the Proposed Action would directly affect 63.3 acres of lynx habitat, converting the lynx habitat into 41.9 acres of “other” habitat and 21.4 acres of “non-habitat.” The additional impacts of the permanent loss of undeveloped and generally effective lynx habitat (i.e., at all times throughout the year, except during the day during the winter ski season) in an LAU whose functionality is currently impaired by Mountain Pine Beetle epidemic effects, collective anthropogenic effects, and natural limitations, would result in an adverse effect to lynx.
- The additional skier use that would result from development of the Beavers would further impair habitat connectivity through the undeveloped portion of A-Basin and the adjacent habitat and

---

<sup>84</sup> Ruediger et al., 2000

<sup>85</sup> Ultimately, the determination of consistency with Standard ALL S1 and the need for a Forest Plan Amendment would be made in the ROD, once the entire analysis is complete and public input is considered.

through the LAU and Loveland Pass Lynx Linkage during the ski season by reducing the amount and expanse of currently available connectivity habitat.

- The combination of increased skier use, permanent habitat removal, and degradation of suitable lynx habitat within the project area would cause an overall reduction in the available functional habitat of a lynx's home range, further adding to the negative impacts that currently exist on daily movements and reproductive movements during the breeding season.
- The relatively small, additional, project-related traffic going through the Loveland Pass Lynx Linkage on Highway 6 would not be insignificant and discountable and could have an adverse effect on lynx (e.g., via increased highway mortality, traffic-impaired habitat connectivity and permeability, habitat fragmentation, reduced home range efficacy, reduced habitat effectiveness adjacent to highways, and impaired recovery/expansion of the Southern Rockies lynx population).

Lynx habitat connectivity would be impaired by the greater use of the Beavers terrain and that impairment would have an adverse effect on daily (intra-home range) and reproductive lynx movements. Lynx movements could also be negatively affected by project-related traffic increases on Highway 6 for those individuals that might cross the highway and travel through forest west of the Continental Divide along the Tenderfoot Mountain. Alternative 2's habitat conversion was greatly reduced from what was originally proposed. However, the direct, permanent habitat loss of 63 acres of high quality winter foraging habitat in an LAU whose functionality is currently impaired further adds to the injury of the poor condition of the LAU. The permanent loss of 63 acres would result in an adverse effect to lynx habitat availability and effectiveness. Snowshoe hare numbers are also likely to decline somewhat in the Beavers as a result of tree removal and increased skiing intensity, further negatively affecting habitat effectiveness. Therefore, Alternative 2 may not be consistent with Guideline HU G3.

Increased guest visits to A-Basin resulting from new and upgraded facilities under Alternative 2 would make incremental contributions to traffic volumes along I-70, Highway 6, and other regional highways as guests commute to and from the ski area over the life of the project. This would have a potential negative impact to lynx crossing highways in the area.

### *R2 Sensitive Species*

Determinations to R2 sensitive species are presented in Table 3G-6. Detailed effects analysis by species is included in the BE found in the project file.

One species of note, boreal toad, maintains habitat near the SUP area. The WRNF annually monitors known boreal toad and other amphibian populations forest-wide. Three potential boreal toad breeding sites have been monitored along the North Fork Snake River. To date, boreal toads have not been detected at the snowmaking pond located downstream of A-Basin's base area. Two historic breeding sites are located further downstream; however, the lower site has not shown evidence of breeding or toads since

2005 and is no longer considered viable. The upper site supports an extant breeding population, one of the eight known populations on the Dillon Ranger District (data associated with this population is contained in the project file). Recruitment in this population is good. All forest that would be affected under Alternative 2 is within the 1.5-mile radius dispersal distance that is considered for boreal toad project analyses on the WRNF. Much of the proposed Beavers tree clearing, the bottom terminal of the proposed Beavers chairlift, and the proposed emergency egress route are within 1,000 meters of the breeding site and may be accessed by dispersing toads through stream, seep, and wetland corridors, as well as through mesic north-facing forest.

The potential, negative, direct and indirect effects to boreal toads and their habitat “may impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.” Table 2-2 includes PDC that would minimize impacts to boreal toad by placing timing restrictions on construction and operations of the emergency egress route.

**Table 3G-6:  
Effects to R2 Sensitive Species – No Action and Proposed Action**

Common name, <i>Scientific name</i>	Determination
<b>INSECTS</b>	
<b>Western bumblebee</b> , <i>Bombus occidentalis</i>	MAII
Great Basin silverspot, <i>Speyeria nokomis nokomis</i>	NI
Monarch butterfly ( <i>Danaus plexippus plexippus</i> )	NI
<b>FISH</b>	
Roundtail chub, <i>Gila robusta</i>	NI
Mountain sucker, <i>Catostomus platyrhynchus</i>	NI
Bluehead sucker, <i>Catostomus discobolus</i>	NI
Flannelmouth sucker, <i>Catostomus latipinnis</i>	NI
<b>Colorado River cutthroat trout</b> , <i>Oncorhynchus clarkii pleuriticus</i>	NI
<b>AMPHIBIANS</b>	
<b>Boreal western toad</b> , <i>Anaxyrus boreas boreas</i>	MAII
<b>Northern leopard frog</b> , <i>Lithobates pipiens</i>	NI
<b>BIRDS</b>	
<b>Northern goshawk</b> , <i>Accipiter gentilis</i>	MAII
Northern harrier, <i>Circus cyaneus</i>	NI
Ferruginous hawk, <i>Buteo regalis</i>	NI
<b>American peregrine falcon</b> , <i>Falco peregrinus anatum</i>	NI
Bald eagle, <i>Haliaeetus leucocephalus</i>	NI
<b>White-tailed ptarmigan</b> , <i>Lagopus leucurus</i>	MAII
Greater sage grouse, <i>Centrocercus urophasianus</i>	NI
Columbian sharp-tailed grouse, <i>Tympanuchus phasianellus columbianus</i>	NI
Flammulated owl, <i>Otus flammeolus</i>	NI

**Table 3G-6:  
Effects to R2 Sensitive Species – No Action and Proposed Action**

<b>Common name, <i>Scientific name</i></b>	<b>Determination</b>
<b>Boreal owl</b> , <i>Aegolius funereus</i>	MAII
Black swift, <i>Cypseloides niger</i>	NI
Lewis' woodpecker, <i>Melanerpes lewis</i>	NI
<b>Olive-sided flycatcher</b> , <i>Contopus cooperi</i>	MAII
Loggerhead shrike, <i>Lanius ludovicianus</i>	NI
Purple martin, <i>Progne subis</i>	NI
Brewer's sparrow, <i>Spizella breweri</i>	NI
Sage sparrow, <i>Amphispiza belli</i>	NI
<b>MAMMALS</b>	
<b>Pygmy shrew</b> , <i>Microsorex hoyi montanus</i>	MAII
Fringed myotis, <i>Myotis thysanodes</i>	NI
Hoary bat, <i>Lasiurus cinereus</i>	NI
Spotted bat, <i>Euderma maculatum</i>	NI
Townsend's big-eared bat, <i>Corynorhinus townsendii townsendii</i>	NI
<b>American marten</b> , <i>Martes americana</i>	MAII
<b>North American wolverine</b> , <i>Gulo gulo luscus</i>	NI
River otter, <i>Lontra canadensis</i>	NI
<b>Rocky Mountain bighorn sheep</b> , <i>Ovis canadensis</i>	MAII

*Notes:*

Other R2 sensitive animals are not listed because they have not been found on the WRNF, they have no affinities to habitats on the project area, the project area is outside of the species' range or elevational distribution, and Alternative 2 would have no impact on those species. Species in bold are potentially present and/or are discussed individually in the text. Wildlife are listed phylogenetically.

Determinations in this table only consider NFS lands that may be directly, indirectly, or cumulatively affected by the action alternatives, which R2 species determinations are based on.

BI = Beneficial impact; MAII = may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing; NI = No impact.

### ***Management Indicator Species***

#### **American Elk**

The entire A-Basin ski area falls within summer range, summer concentration area, and overall range for elk. Because the local population of elk migrates to lower elevations during the winter, this species would be primarily impacted by summer construction, recreation, and maintenance during summer and fall months. Direct effects would include the loss of alpine summer range associated with the graded Beaver Bowl trails, the top terminals of the Pallavicini and Beavers chairlifts, the Zuma Access surface lift, and other more localized infrastructure installation (e.g., chairlift and canopy tour towers) below treeline during intervals of human activity. The proposed Beavers chairlift and development of Beaver Bowl would extend beyond areas of current summer human activity. Associated construction activity would likely displace elk from summer habitat and maintenance periods.

While Alternative 2 may not have measurable impacts on habitat effectiveness within the Data Analysis Unit (DAU) or elk population parameters at the Forest level, it would have additive, negative effects on the local elk herd by increasing summer disturbance and reducing overall summer habitat.

#### American Pipit

Ground disturbance associated with the proposed projects would result in a net loss of several acres of American pipit foraging and nesting habitat. The disturbance area is equivalent to two average size territories of this species' mean territory size. Not all proposed disturbance areas are suitable as nesting habitat.

Alternative 2 would result in a small net loss of habitat used by American pipits and other species associated with alpine grasslands. The Proposed Action would not measurably contribute to any negative trend in the forest-wide population or habitat trend of this MIS that would affect achieving Forest Plan MIS objectives.

#### Aquatic Macroinvertebrates and Trout

Alternative 2 includes a number of required, site-specific, watershed and aquatic resources management measures that would be implemented to avoid, minimize, and mitigate negative project component effects to aquatic habitat within and below the Project Area that could alter aquatic faunal communities. Refer to Table 2-2 for PDC to minimize stream health impacts and Chapter 3, Section I – Watershed for additional stream health analysis. Alternative 2 could cause minor, short-term and permanent, ground disturbances that could increase runoff with the potential to increase erosion and sedimentation that could extend to local creeks. However, these potential effects are expected to be most likely during and following construction activities and, thereafter, infrequent and minor to the extent that they would not cause negative changes to the hydrology, water quality, stream health, aquatic habitat, or macroinvertebrate communities within Project Area streams. Alternative 2 would maintain physical stream health through successful implementation of PDC, continue to provide aquatic macroinvertebrate habitat in all project area streams, and would not measurably contribute to any negative trend in the forest-wide population or habitat trend of aquatic macroinvertebrates that would affect achieving Forest Plan MIS objectives.

#### *Migratory Birds*

No bird nests were detected in proposed impact areas during field surveys, although suitable nesting habitat is present in some areas for some migratory birds known to inhabit the Project Area and additional nest surveys would be conducted pre-construction. The project has been designed, to the extent practicable, to minimize incidental take through the implementation of PDC. Construction may occur within that nesting period if surveys show no nests or altricial young present, or as otherwise approved by the Forest Service. It is possible that undetected active nests of migratory birds could occur in impact areas during tree removal, possibly resulting in the incidental take of eggs and altricial young. Under such circumstances, the Proposed Action would be consistent with the Forest Service/USFWS MOU because of the attempt to reduce take of migratory birds.

### *Species of Local Concern*

#### Mule Deer

Alternative 2 would likely result in lower summer deer use of the Project Area. The canopy tour, operating Black Mountain Express chairlift, and the challenge course would produce the greatest year-round displacement. Deer would not be displaced as far or as long from human activity areas as other MIS species because of their greater tolerance and habituation to the additional benign activities associated with Alternative 2. Affected forest cover now functions as refugia, where deer can retreat from human activity areas during the day before returning to those areas “after hours.” Negative project effects would be largely the result of increases in the levels and distribution of human activity within the existing lightly used summer recreation area, rather than the relatively small amount of habitat loss. Effects of Alternative 2 would not block or restrict deer movements. While Alternative 2 would have additive, negative effects on summer mule deer use, those effects would not be measurable on habitat effectiveness within the DAU.

#### Mountain Goat

Alternative 2 would have additive, negative effects on summer mountain goat use of the alpine within the A-Basin SUP area. Direct effects would be associated with the permanent loss of several acres of foraging habitat. Indirect, construction- and maintenance-related effects would displace goats from a larger area of adjacent habitat currently affected by maintenance activities. Construction activities would be localized at the alpine construction sites, but the resulting displacement could extend beyond the construction season (i.e., into subsequent years). Production use of habitats adjacent to the project components around the top of the Lenawee Mountain chairlift may be negatively affected by disturbance during the construction season(s) and nannies and kids may be displaced by increased human activity. While kidding is generally over by the time construction would start (the majority would occur after July 1), summer use of the tundra and cliffs adjacent to the Lenawee Mountain chairlift’s top terminal by nannies and kids could be impacted depending on the level of construction-related activity. Recreation-related project components and use would not extend to goat habitats.

## **CUMULATIVE EFFECTS**

### Scope of the Analysis

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of wildlife and aquatic resources extends from A-Basin’s inception as a ski area in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of wildlife and aquatic resources varies by species and is discussed above in the Affected Environment.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on wildlife and aquatic resources and are analyzed below:

- A-Basin MDP Update
- Keystone Resort Dercum Mountain Improvements Projects EA
- Keystone Resort MDP
- Continued Build-out of Summit County
- Continued Build-out of Snake River Basin
- Residential Developments in the Lower Blue River Basin
- 2011 Keystone Ski Area Forest Health Project
- Lower Snake Wildland Urban Interface Project
- Tenderfoot Mountain Motorcycle Trail System Project EA
- WRNF Forest Plan – 2002 Revision
- WRNF Travel Management Plan

Projects identified by the Forest Service and listed as reasonably foreseeable in Appendix A with relevance to wildlife are included in the cumulative effects analysis. Some of those projects are also reasonably certain, and their effects on lynx and other wildlife species are considered in more detail in wildlife technical documents.

Reasonably foreseeable projects considered in this analysis would contribute no additional cumulative effects to the following species: the Western Bumblebee, Colorado River Cutthroat Trout, Boreal Western Toad and Northern Leopard Frog, White-tailed Ptarmigan, Boreal Owl, Olive-sided Flycatcher, Pygmy Shrew, American Marten, North American Wolverine, and Rocky Mountain Bighorn Sheep, as the impact zone associated with the proposed projects would not extend to potential habitat for the aforementioned species. This exclusion also extends to several MIS species, including; the American Pipit, Aquatic Macroinvertebrates, American Elk and the aforementioned Cutthroat Trout, as the proposed projects would not extend to interconnecting flowing water or potential habitats that could be directly and indirectly affected by the Proposed Action and other cumulative effects projects areas.

Overall growth within the Analysis Area will also cause incremental increases in traffic along I-70 and Highways 6 and 9 in the Snake River LAU and other LAUs along Summit County access corridors. It may be assumed that this increase in traffic may further inhibit connectivity and increase the probability of road-animal interactions.

Virtually all residential development resulting from projected population growth will occur on private lands within towns and in surrounding unincorporated subdivisions, most of which do not support lynx habitat, but do support general wildlife habitat, including habitat for certain R2 sensitive species and MIS. There could be parcels developed along the margins of lynx habitat that would result in relatively small, additional losses of effective foraging and travel habitats.

As described in the wildlife technical reports contained in the project file, the action alternatives would result in varying levels of cumulative impacts for the variety of species considered.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

The amount of habitat modifications, as well as disturbances during the summer season, could irretrievably affect some individual members of various wildlife species, but are not considered irreversible.

## **H. SOILS**

### **SCOPE OF THE ANALYSIS**

The Analysis Area for soil resources includes areas proposed for direct ground disturbance in the Lenawee Creek and North Fork Snake River watersheds within A-Basin's SUP area. This analysis is based on review of the Holy Cross Area Soil Survey. No site-specific soil surveys were completed for this analysis, but would be required prior to implementation of any approved projects as determined by the Forest Service Soil Scientist or their representative.

### **FOREST PLAN DIRECTION**

Both the 2002 Forest Plan and the WCPH provide soil management measures to guide land treatments within the WRNF. The following direction applies to the proposed projects analyzed in this DEIS.

#### **WRNF 2002 Forest Plan**

##### ***8.25 Ski Areas – Existing and Potential***

Soils Standard 1. Effective ground cover (mulch) upon completion of ground disturbing activities will meet minimum levels of pre-treatment habitat type (Aspen 95 percent, Lodgepole Pine 90 percent, Spruce-Fir 95 percent).

Soils Guideline 1. Ground cover as a combination of revegetation and mulch applications, should meet the requirements in Table 3H-1, one and two years following completion of ground disturbing activities.

**Table 3H-1:  
Soils Guideline 1 – Ground Cover Requirements**

<b>Erosion Hazard Class</b>	<b>Year 1 Minimum Effective Ground Cover (%)</b>	<b>Year 2 Minimum Effective Ground Cover (%)</b>
Low	20–30	30–40
Moderate	30–45	40–60
High	45–60	60–75
Very High/Sever	60–90	75–90

### *Soils*

Guideline 1. Conduct an onsite slope stability exam in areas identified as potentially unstable. Potentially unstable land is described as having a “high” or “severe” instability ranking on the WRNF Landscape Stability Model, and/or by field determinations by qualified natural resource specialists. Limit intensive ground-disturbing activities on unstable slopes identified during examinations.

### **Forest Service WCPH**

#### *Hydrologic Function*

- 11.1 Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.
- 11.2 Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.

#### *Riparian Areas and Wetlands*

- 12.4 Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.
- 12.6 Manage water-use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.

#### *Sediment Control*

- 13.1 Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate.
- 13.3 Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.
- 13.4 Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.

#### *Soil Quality*

- 14.2 Maintain or improve long-term levels of organic matter and nutrients on all lands.

## **AFFECTED ENVIRONMENT**

The Analysis Area is between the elevation of 10,700 feet and 13,050 feet above mean sea level. Most of the precipitation in the Analysis Area occurs as snowfall, and total precipitation averages 20.4 inches annually.<sup>86</sup> The climate and elevation of the Analysis Area limit the rate of soil formation.

### **Geology of A-Basin**

The front side of A-Basin, from the North Fork Snake River to the summit of Lenawee Mountain, is primarily underlain by quartz monzonite gneiss from the Algonkian period.<sup>87</sup> Glacial till which occurred later, during the Pleistocene epoch of the Quaternary period, can be found amongst the other formations along the front side of the mountain. Additionally, there has been a presence of landslides and rock glaciers.<sup>88</sup>

The large angular rock fragments on the surface and within the soil deposited by glacial till make up much of the rocky topography that A-Basin is known for. Steep slopes characterize much of the mountain and more than half of the skiable terrain falls above treeline. At the highest elevation of accessible terrain are the steep chutes and couloirs of A-Basin's East Wall, running along the ridgeline of Lenawee Mountain. The East Wall is composed primarily of quartz monzonite of the Tertiary period's Eocene epoch which holds large veins of crystallized minerals.<sup>89</sup> The back side of A-Basin, which encompasses Montezuma Bowl and its trail network, is composed of primarily the same minerals as the front side of the ski area. There is a higher concentration of the more recent quartz monzonite of the Tertiary period in this area and elevation does not reach the same extent as the front side, following the lower ridge line of Lenawee Mountain.<sup>90</sup> Similar to the front side, the topography in this area is characterized by steep slopes and large rock outcroppings.

The Analysis Area was compared with the WRNF Stability Model (refer to Map 3H-1). Slope stability ratings were developed through an evaluation of area geology, slopes, and landslide risk (based on past landslide mapping). The susceptibility of soils within the SUP area to irreversible damage to soil productivity from tree removal ranges from "slight" to "severe" (although primarily the susceptibility is "slight" to "low"). Approximately 30 acres of terrain within the SUP (all in the East Wall area) is characterized as having "severe" susceptibility to irreversible damage to soil productivity. The risk to stability in these areas should be minimized by ensuring drainage is properly managed to reduce potential impacts to soils. Additionally, damage to soil resources can be further reduced by maintaining and improving levels of soil organic matter as this material contributes to retaining soil moisture and attenuating runoff. An assessment of bare ground at A-Basin was completed to identify areas that could benefit from receiving additional rehabilitation by amending those areas that have not recovered with

---

<sup>86</sup> NCDC, 2014

<sup>87</sup> National Geologic Map Database, 2015

<sup>88</sup> Ibid.

<sup>89</sup> Ibid.

<sup>90</sup> Ibid.

carbonaceous soil amendments to minimize the potential risk to stability (refer to the results of the bare ground assessment in the following soils discussion).

### **Soils of A-Basin**

Fifteen soils units were mapped within the A-Basin SUP area. These soils can be grouped into Leighcan, Cryaquolls, Hechtman, Tolby, Hiwan, Moran, and Teewinot. Mapped miscellaneous land types include cirque, rock outcrop, rubble land, and standing water. Table 3H-2 summarizes the general soil characteristics. Refer to Map 3H-1 under the Alternative 2 discussion for more information.

**Table 3H-2:  
General Characteristics of Mapped Soil Units**

Map Unit/ Name	Area in SUP (acres)	Drainage Class	Available Water Capacity <sup>a</sup>	Runoff <sup>b</sup>	Effective Rooting Depth
<b>225B</b>	153.0				
Leighcan		somewhat exc.	low	slow	>60"
Cryaquolls		very poorly	moderate	moderate	>60"
<b>254D</b>	9.0				
Leighcan		somewhat exc.	low	moderate	20–40"
Hechtman		somewhat exc.	low	rapid	< 20"
Rock outcrop					
<b>290B</b>	256.3				
Leighcan		somewhat exc.	low	slow	>60"
<b>290C</b>	20.0				
Leighcan		somewhat exc.	low	slow	>60"
<b>604C</b>	241.7				
Leighcan		somewhat exc.	low	moderate	>20"
<b>604D</b>	124.7				
Leighcan		somewhat exc.	low	moderate	>20"
Rock outcrop					
<b>654D</b>	135.0				
Tolby		excessively	very low	moderate	>20"
Hiwan		excessively	very low	rapid	>20"
Rock outcrop					
<b>670C</b>	79.6				
Leighcan		somewhat exc.	low	moderate	>20"
Tolby		excessively	very low	moderate	>20"
<b>901B</b>	109.9				
Moran		somewhat exc.	low	moderate	>20"
Rubble land				slow	
<b>901D</b>	283.3				
Moran		somewhat exc.	low	moderate	>20"
Teewinot		well	moderate	rapid	< 20"
Rock outcrop					
<b>908B</b>	107.3				

**Table 3H-2:  
General Characteristics of Mapped Soil Units**

Map Unit/ Name	Area in SUP (acres)	Drainage Class	Available Water Capacity <sup>a</sup>	Runoff <sup>b</sup>	Effective Rooting Depth
Moran		somewhat exc.	low	moderate	>20"
Cryaquolls		well	moderate	moderate	>40"
Rock outcrop		N/A	N/A	N/A	N/A
<b>CQ</b>	282.2				
Cirque land		N/A	N/A	N/A	N/A
<b>RL</b>	17.7				
Rubble land		N/A	N/A	N/A	N/A
<b>RO/RL</b>	40.5				
Rock Outcrop		hydro group D	N/A	high	N/A
Rubble Land		hydro group A	low	low	N/A
<b>W</b>	4.1				
Water		N/A	N/A	N/A	N/A

Source: USDA Forest Service, 1998

Notes:

<sup>a</sup> Available Water Capacity refers to the volume of water that should be available to plants if the soil, inclusive of rock fragments, were at field capacity.

<sup>b</sup> Runoff refers to the degree to/rate at which precipitation, once interfaced with the soil, flows as a result of gravitational forces. Greater rates of runoff are generally consistent with greater erosion risk.

exc. = excessively; N/A = not applicable

Drainage class ratings for these soils range from very poorly to somewhat excessively drained and have variable runoff potential (low to high) and very low to moderate variable water holding capacity. Limitations to re-vegetation potential range from slight (areas where mulch applications would improve success by conserving soils moisture and protecting seedling establishment) to severe; severe limitations exist where slope, short growing season, low water capacity, high erosion hazard, and/or shallow soils depth are likely to hamper re-vegetation success. Cut/fill slope stability potential varies widely from slight to severe due to saturated soil, high water table, sandy materials and slope. In their native condition, mass movement potentials of soils within the Analysis Area was generally low, but increase to moderate or high in certain cases. Excess site moisture associated with snowmaking and ski area drainage, coupled with the loss of soil organic matter from previous grading activities, can exacerbate this risk.

Surface and subsurface soil erodibility is low within the Analysis Area, with K-factor ( $K_w$ ) values of surface soil horizons up to 0.15.<sup>91</sup> The whole soil K-factor (with the  $w$  subscript) best reflects natural soil conditions in the field because the whole soil factor considers rock fragments which serve to “armor” soil and make them less erodible overall.<sup>92</sup> Soil organic matter can also be related to soil erodibility as organic

<sup>91</sup> National Resource Conservation Service, 2008; The K-factor represents the soil’s susceptibility to erosion in their plot condition based on soil texture. Soils that are resistant to erosion have low K values (0.02 to 0.15); soils that display moderate erosion potential are in the middle of the range (0.16 to 0.27); and highly erodible soils tend to have values greater than 0.28.

<sup>92</sup> McCormick et al., 1982

horizons allow infiltration and provide productive soils for stabilizing vegetation.<sup>93</sup> Maintenance of soil organic matter and surface O- and A-horizon integrity minimizes erosion, compaction, and hydrology problems within the ski area.

The existing developed trail network at A-Basin accounts for a total of approximately 958 acres of skiable terrain. Tree removal and grading associated with ski trails, lift installation, mountain access roads, guest service facilities, and hiking/biking trail construction have altered the terrain, soils, and vegetation of the area. A number of trails have been cleared across 200 acres on the front side of A-Basin; however, because the ski area is generally located near treeline, much of the developed terrain has been created using natural openings and above treeline terrain. A bare ground assessment was completed revealing approximately 42 acres of the SUP area could benefit from receiving additional rehabilitation with carbonaceous soil amendments. WRNF specialists identified areas as having significant bare ground and low vegetative cover (i.e., generally containing 1 to 25 percent vegetation cover and 30 to 70 percent rock cover). In these areas, pedestals, rills, and water flow patterns may be common indicating surface runoff. These soil conditions may be improved through soil rehabilitation and drainage management. None of the 42 acres of bare ground that has been identified for rehabilitation overlaps terrain classified as having “severe” stability risk according to the WRNF Stability Model. Field surveys and project implementation teams would watch for and consider visible indicators of landscape.

The Beavers area currently exists as a natural alpine and forested area. Although this area receives some use by backcountry skiers, soils and vegetation exist in an undisturbed state.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

No new grading or vegetation removal is included in Alternative 1. However, on-going ski area operations and maintenance would continue to require management to reduce erosion and loss of soil organic material within A-Basin’s SUP area.

### **Alternative 2 – Proposed Action**

#### *Geology*

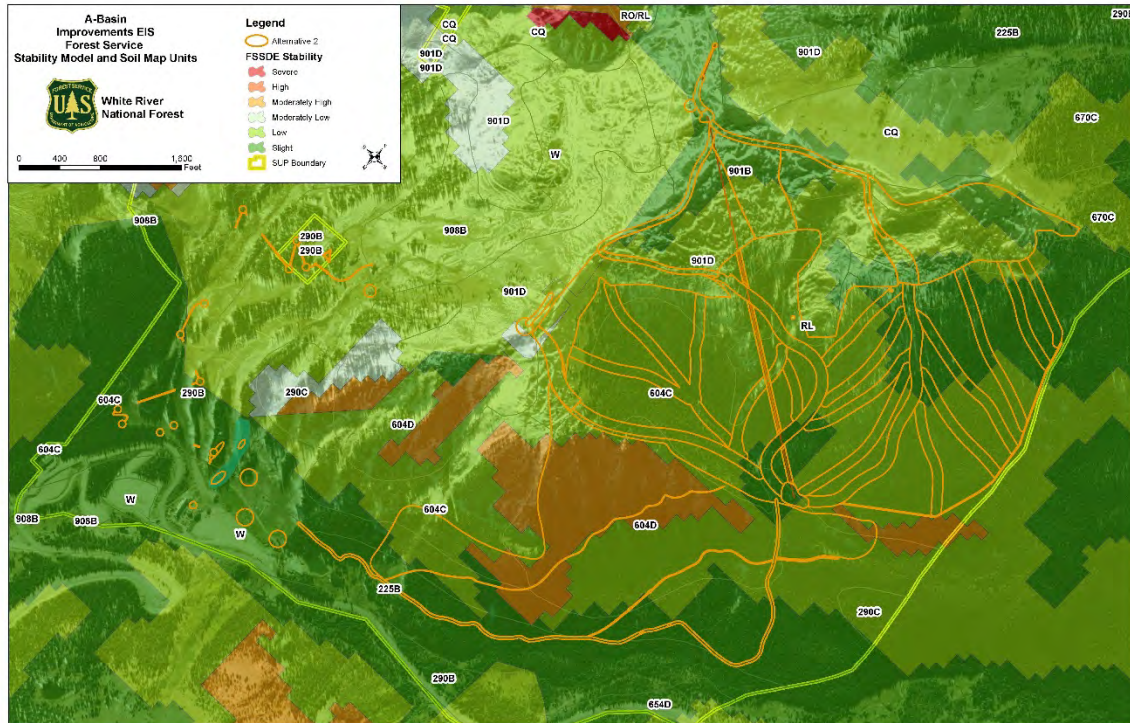
Projects included in the Proposed Action were compared with the WRNF Stability Model (refer to Map 3H-1). Slope stability ratings were developed through an evaluation of area geology, slopes and landslide risk (based on past landslide mapping). The susceptibility of these indicators to causing irreversible resource damage to soil productivity and watershed condition from timber harvest ranges from “slight” to “severe.” The proposed projects would have similar impacts from tree clearing and soil disturbance. Projects were found to overlap areas with a range of mass movement potential, from “slight” to “moderately high.” Generally, proposed project locations overlap areas of “slight” to “low” mass

---

<sup>93</sup> Franzluebbbers, 2002; McMullen, 2011

movement potential and projects could be implemented without special design considerations in these areas.

**Map 3H-1:  
Forest Service Stability Model and Soil Map Units**



Proposed projects that would be constructed within or near areas that have been identified as having “moderately high” stability risk include portions of the traverses associated with the Steep Gullies component of the project. Construction of the proposed traverses in this area would require minimal tree removal and no ground disturbance in areas that are identified as having “moderately high” mass movement potential. Trees would be cut and scattered and stumps and roots would be left in place. During trail layout, the length of the trail would be reviewed for indications of landscape instability and built to minimize that risk.

The risk to stability has potential to impact project design; therefore, PDC may be required to ensure drainage is properly managed to minimize potential impacts from the projects to soils, and from stability issues on the project elements. These stability rankings are not limiting to the proposed projects, as these rankings are derived from a model rather than strictly empirical data. Field surveys and project implementation would watch for and consider visible indicators of landscape instability such as tension cracks and rill/gully erosion and appropriate erosion control and drainage management would be employed to maintain soil productivity and watershed condition.

## Soils

Approximately 79 acres of disturbance would occur in the soil map units identified in Table 3H-3. The Proposed Action includes approximately 22.4 acres of tree removal for cleared trails, 5.8 acres of grading, 2.8 acres of tree removal and grading, and approximately 48 acres would be thinned for tree skiing. Disturbance to soils from these projects varies widely from grading to tree thinning where stumps and roots would be left in place and the disturbance would be restricted to access for tree removal activities.

The approximate 8.6 acres of grading would require diligent adherence to soils-related PDC and BMPs to maintain levels of soil organic matter and re-establish vegetation in these areas. To remain consistent with other recent WRNF ski area projects, areas of new permanent impacts (0.2 acre of soils would be permanently removed for installation of the chairlift, as well as less than 0.2 acre of soils for installation of canopy tour towers) and significant grading would need to be offset by mitigation of a commensurate (1:1 acre) acreage of previously-disturbed ground identified in the bare ground digitization project and by ski area/WRNF personnel. This collaborative approach to restoration of both current and past construction projects allows the ski area to meet soil and other resource protections and improve watershed, wildlife, and overall conditions on the ground. The approximate 22.4 acres of tree removal is generally associated with the establishment of new ski trails and associated infrastructure although some is also attributed to corridors for the challenge course and canopy tour. In the long-term, soil disturbance could be minimized in these areas by maintaining an herbaceous vegetative cover as well as levels of soil organic matter (soil O and/or A horizons).

**Table 3H-3:  
Project Disturbance**

Project	Disturbance Type	Total Acres
<b>Beavers Lift</b>		
	Clearing	2.1
	Grading	0.4
	Clearing & Grading	1.0
<b>Canopy Tour</b>		
	Clearing	0.6
	Grading	0.3
	Clearing & Grading	1.3
<b>Challenge Course</b>		
	Clearing & Grading	0.4
<b>Lenawee Summit Grading</b>		
	Grading	0.5
<b>Molly Hogan Lift Replacement</b>		
	Grading	1.0
<b>Norway Lift Removal</b>		
	Grading	0.5

**Table 3H-3:  
Project Disturbance**

Project	Disturbance Type	Total Acres
<b>Pallavinci Grading &amp; Replacement</b>		
	Grading	1.4
<b>Picnic Table</b>		
	Grading	0.1
	Clearing & Grading	0.0
<b>Beavers Trails</b>		
	Clearing	14.0
	Grading	1.8
<b>Steep Gullies Traverse/Egress Routes</b>		
	Clearing	4.9
	Clearing & Grading	0.1
<b>Beavers Tree Skiing</b>		
	Tree Skiing	48.0
	Clearing	0.7
<b>Zuma Access Surface Lift</b>		
	Grading	0.1

*Note:* Numbers in this table were rounded to the nearest tenth, resulting in some minor differences between the total acres of projects and their respective soil map units.

Under the Proposed Action, no new roads would be necessary for construction of any of the proposed projects. A-Basin's existing road network provides sufficient wheeled access to the top of the mountain and nearly all project locations. Low-impact machinery (e.g., a spider hoe) can be walked down even steep terrain to assist in chairlift and trail construction. Helicopters would be used for transport/installation of heavy infrastructure.

### *Trails*

Proposed tree removal for skiing terrain in the Beavers would be accomplished over-the-snow and on dry ground. No skid roads would be constructed. Vegetation removal for flat portions of the emergency egress route/hike back route would primarily be conducted over-the-snow, followed by flush-cutting in the summer. This practice would allow timber to be removed via snowcat via hike-back route to avoid impacts to wetlands. Vegetation would be removed from the steep portion of the emergency egress route (below the bottom terminal of the Beavers chairlift) during the summer and would be pile burned on-site or removed via helicopter on steeper slopes.

Proposed Trails B-2 and B-4 (refer to Figure 2) would be clear cut during the summer months and the timber would be disposed of by pile burning, chipping, or helicopter logging (on steeper slopes). A masticator could be used on a spider hoe. While removed vegetation would be primarily flush-cut, there could be minimal treatment of stumps (including treatment with a mastication implement or spider hoe)

that would otherwise pose a safety risk to skiers. For the graded sections of Trails B-2 and B-4, earthwork would be accomplished by the spider hoe and explosives to loosen the soil to facilitate the grading process and to minimize the access footprint. Explosives may be used for a brief period of time and would not be used near streams, wetlands, or fens.

Proposed tree skiing Trails B-1 and B-3, proposed tree skiing centerlines, and the tree skiing catchment line (refer to Figure 2), would be hand cut and the vegetation would be burned in smaller piles along the trails within openings cleared for skiing.

Rock blasting would be employed as necessary within the project area to remove rock outcroppings.

### *Chairlifts*

All chairlift projects would be accessed via existing mountain roads, where available; no new roads are proposed. Construction of the Beavers chairlift and replacement of the Pallavicini and Molly Hogan chairlifts would occur using existing on mountain access roads, a spider hoe and helicopters. A spider hoe would be used over dry ground to dig tower foundations and grade the terminal locations, resulting in 0.2 acre of new permanent bare ground. Construction of the Zuma Access surface lift would occur using existing on mountain access roads.

### *Multi-Season Recreation Activities*

The location of the challenge course would be easily accessible from the base area, and construction would be accomplished using existing on mountain access roads. The majority of the proposed canopy tour towers would be accessible via existing on-mountain access roads. Construction of certain towers would most likely be completed over-the-snow to minimize resource impacts. Materials and low-impact machinery would be transported to the tower locations on existing on-mountain roads or in the 10-foot-wide clearance zone. With the exception of the access paths to and from the first and last towers, no permanent access paths would be associated the proposed canopy tour, and emergency egress does not require construction of its own path. Installation of the canopy towers themselves would result in less than 0.2 acre of new permanent bare ground.

Impacts to soil resources from tree removal can occur from access to the area, skidding timber for removal and/or prescribed burns, reduced moisture uptake and exposure of soils from the loss of overstory vegetation. The rehabilitation of soils surrounding burn piles will be necessary to restore soil health in areas where this removal technique has been implemented.

All of these tree removal techniques may result in some level of compaction, loss of ground cover and/or soil organic matter. Aerial removal would likely have the least impacts, and over-ground skidding would likely result in the greatest extent of surface disturbance (both loss of ground cover and soil organic matter), as well as compaction. Concentrating disturbance and minimizing the distance trees are skidded would maintain natural vegetative cover and depths of soil organic matter (soil O and/or A horizons) in

some areas. Additionally, skidding over the snow would result in less impacts to the soil resource (loss of A-horizon, vegetation, etc.) and would be utilized where practicable. Data collected from site specific inventories, and characterization of soil organic matter quantities prior to implementation of any approved projects, would serve as a baseline for the existing condition regarding soil organic matter.

In areas where grading is proposed, topsoil would be removed and soils would be temporarily compacted. However, with the exception of top and bottom lift terminals and tower footers, and access paths soils would be mechanically de-compacted and stockpiled; topsoil would be re-spread to facilitate revegetation success.

Reassessment of the quantity (depths) of soil in the A-horizon and/or organic ground cover would be made to ensure no net loss of this material, consistent with the WCPH. To ensure organic ground cover is maintained, post-treatment slash would be returned to the site. If and when loss of soil organic matter is documented, these losses will be mitigated by amending soils with carbonaceous soil amendments in coordination with the WRNF Soil Scientist or their representative. Where needed, carbon-rich soil amendments such as compost, composted biosolids, biochar, or a combination of these materials will be added to restore site organic matter and nutrients if post-implementation surveys show a net loss of soil organic material. Seed mixtures and mulches would be free of noxious weeds and persistent/invasive exotic plants. These will be approved by the appropriate WRNF resource personnel or their representatives and adhere to relevant PDC.

For all of the proposed projects under Alternative 2, implementation of the soil management requirements and PDC would minimize erosion and impacts to soil organic material in the Analysis Area (Table 2-2).

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of soil resources extend from A-Basin's inception as a ski area in 1946, through the foreseeable future in which the ski area can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of soil resources is the A-Basin SUP area.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area and County development projects have been incorporated and analyzed in this document as part of the

Affected Environment. The following projects could have cumulative impacts on social and economic resources and are analyzed below:

- A-Basin MDP Update

The development of trails, lifts, infrastructure, and skier facilities on NFS lands in the SUP area has occurred since the 1940s. Over seven decades of development, there has been a loss of soil organic content (organic O and mineral A horizons) and increased impermeable surfaces within these soil map units. These past ski area activities have resulted in approximately 42 acres of bare ground that could be rehabilitated within the Analysis Area.<sup>94</sup> Past projects from the approved MDP, discussed in the affected environment section, have resulted in a loss of soil organic matter. This loss requires identification of soil rehabilitation sites from the bare ground analysis to ensure consistency with Forest Plan standards. The majority of this disturbance has been revegetated; however, these sites require ongoing rehabilitation and management in order to address the impacts of vegetation removal and grading, return soil organic matter, and facilitate successful revegetation to the area.

A-Basin currently implements drainage management and erosion control such as water bars and revegetation (as required by the Forest Service). The effectiveness of these management activities at stabilizing soils within the Analysis Area would be assessed during the site-specific field surveys. Approximately 22.4 acres of tree removal and 5.8 acres of grading are included in the Proposed Action; however, most disturbance (aside from lift installation, canopy tour and challenge course installation) would be temporary and would be rehabilitated after construction. A PDC contained in Table 2-2 requires that there would be no net loss of soil organic material. A-Basin and the Forest Service will use the results of the bare ground analysis to coordinate and implement future soil reclamation and rehabilitation projects (including soil amendments) to address past impacts. When considered cumulatively, if the Proposed Action is carefully managed with effective erosion control, considering the low erodibility of soil management units these projects could be implemented without further impacts to the soils resource, and would not affect the soil management unit as a whole.

When considered cumulatively with the proposed projects, other past, present and future projects affect soils by reducing soil organic matter and increase exposure and compaction resulting in increased erosion within the Analysis Area. However, with implementation of project PDC, cumulative effects of these issues when considered with Alternative 2 within the Analysis Area could be minimized. Current and future conditions of soils within the Analysis Area are anticipated to maintain compliance with the 2002 Forest Plan and the WCHP. Innovative uses of newly available soil amendments that increase soil moisture, nutrient, and carbon storage could serve to not only offset impacts to soil resources from the Proposed Action, but also to improve baseline soil conditions at A-Basin.

---

<sup>94</sup> This acreage of existing bare ground within the Analysis Area is based on a bare ground soils analysis that is not finalized. This acreage is subject to change.

## IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

As a result of Alternative 2, approximately 0.2 acre of soils would be lost due to installation of lift infrastructure as well as less than 0.2 acre of soils due to installation of canopy tour towers. Although these losses would represent a minimal acreage within the soil map unit as a whole, soil is a very slowly renewable resource, as estimates for rates of soil formation range from 0.0056 cm to 0.00078 cm per year.<sup>95</sup> Globally, rates of soil formation are not keeping pace with erosion, leading to widespread soil loss that in part owes to grading activities such as those associated with ski area development.<sup>96</sup> In this sense, soil loss from development for projects at A-Basin is an irreversible and irretrievable commitment of resources.

## I. WATER RESOURCES

### SCOPE OF THE ANALYSIS

The scope of the analysis of water resources focuses on streams and riparian areas tributary to North Fork Snake River and located on NFS lands, within A-Basin's SUP area.

### FOREST PLAN DIRECTION

Pursuant to the Forest Plan, as amended, the R2 WCPH provides management measures and PDC to protect soil, aquatic, and riparian systems. Management measures are environmental goals which can be attained by using one or more PDC. If implemented properly, the PDC and management measures will ensure applicable federal and state laws are met on NFS lands in R2.<sup>97</sup> Management measures of relevance regarding water resources are outlined below.

#### **Applicable WCPH Management Measures**

##### *Hydrologic Function*

- 11.1 Management Measure (1). Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.
- 11.2 Management Measure (2). Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.

##### *Riparian Areas and Wetlands*

- 12.1 Management Measure (3). In the WIZ next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.

---

<sup>95</sup> Alexander, 2006

<sup>96</sup> Wakatsuki and Rasyidin, 1992

<sup>97</sup> USDA Forest Service, 2002 and 2005

- 12.3 Management Measure (5). Conduct actions so that stream pattern, geometry, and habitats maintain or improve long-term stream health.
- 12.4 Management Measure (6). Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.
- 12.6 Management Measure (8). Manage water use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.

### *Sediment Control*

- 13.1 Management Measure (9). Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate.
- 13.2 Management Measure (10). Construct all roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.
- 13.3 Management Measure (11). Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.
- 13.4 Management Measure (12). Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.

### *Water Purity*

- 15.2 Management Measure (16). Apply runoff controls to disconnect new pollutant sources from surface and groundwater.

### **Relevant WCPH Definitions**

Additionally, the WCPH provides definitions for some terms that are important to conveying information in this report:

CDAs: High runoff areas like roads and other disturbed sites that have a continuous surface flow path into a stream or lake. Hydrologic connection exists where overland flow, sediment or pollutants have a direct route to the channel network. CDAs include roads, ditches, compacted soils, bare soils, and areas of high burn severity that are directly connected to the channel system. Ground disturbing activities located within the water influence zone should be considered connected unless site-specific actions are taken to disconnect them from streams.

Gully: An erosion channel greater than 1 foot deep.

Hydrologic Function: The ability of a watershed to infiltrate precipitation and naturally regulate runoff so streams are in dynamic equilibrium with their channels and floodplains.

Land Treatments: Human actions that disturb vegetation, ground cover, or soil.

Perennial Stream: A stream or reach of a channel that flows continuously or nearly so throughout the year and whose upper surface is generally lower than the top of the zone of saturation in the areas adjacent to the stream.

Rill: An erosion channel less than 1 foot deep.

Stream Health: The condition of a stream versus reference conditions for the stream type and geology, using metrics such as channel geometry, large woody debris, substrate, bank stability, flow regime, water chemistry, and aquatic biota.

Stream Health Class: A category of stream health. Three classes are recognized in the Rocky Mountain Region: robust, at-risk and diminished. These classes are recommended to be used for assessing long-term stream health and impacts from management activities.

Stream Order: A method of numbering streams as part of a drainage basin network. The smallest unbranched mapped tributary is called first-order, the stream receiving the tributary is called second-order and so on.<sup>98</sup>

WIZ: The land next to water bodies where vegetation plays a major role in sustaining long-term integrity of aquatic systems. It includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge. Its minimum horizontal width (from top of each bank) is 100 feet or the mean height of mature dominant late-seral vegetation, whichever is most.

## **AFFECTED ENVIRONMENT**

### **Project Area Description**

A-Basin is situated at elevations ranging from 10,700 feet and 13,050 feet above mean sea level. Most of the precipitation in the Analysis Area occurs as snowfall, and total precipitation averages 20.4 inches annually.<sup>99</sup> Monthly mean temperatures during the winter months are between 17° and 20° Fahrenheit; average temperatures for the summer months range between 47° and 52° Fahrenheit.<sup>100</sup>

Mountain slopes in the Project Area generally drain in a south-to-north direction and are tributary to North Fork Snake River, which in turn flows west into Dillon Reservoir. For purposes of this analysis, four small watersheds (the study watersheds) were delineated within the Project Area:

- Watershed #1: a second-order watershed located near the eastern boundary of A-Basin's SUP, extending from the top of Lenawee Mountain down to the ski area's base area. It contains 870 acres and is the watershed where the vast majority of A-Basin's ski trails and infrastructure exists, including mountain roads and snowmaking.

---

<sup>98</sup> EPA, 1980

<sup>99</sup> NCDC, 2014

<sup>100</sup> PRISM Climate Group, 2013

- Watershed #2: a 250-acre hill-slope watershed that includes the Steep Gullies. Two small perennial streams of first-order, and several springs and seeps exist in this watershed. Existing land treatments in this watershed include the ski trails served by the Black Mountain Express chairlift.
- Watershed #3: a small perennial stream conveys surface water in this 260-acre watershed. Most of the Beaver Bowl and proposed Beavers trails and tree skiing terrain are in this watershed.
- Watershed #4: a hill-slope watershed, contains 360 acres from Porcupine Peak down to North Fork Snake River. The proposed Tree Skiing Centerline C and upper section of Tree Skiing Catchment Line would be located in this watershed.

Table 3I-1 summarizes the quantitative description of the study watersheds. It is also important to note that none of the stream segments within the Analysis Area are listed on the Colorado State 303(d) list as impaired streams under the CWA.<sup>101</sup>

## **Watershed**

### *Water Yield*

To help further characterize the study watersheds, hydrographs were developed following the methodologies presented in the WRENSS Procedural Handbook, as updated by Troendle, Nankervis, and Porth (2003), and supplemented by the Colorado Ski Country USA (CSCUSA) Handbook.<sup>102</sup> In summary, the WRENSS Model generates a water balance using seasonal precipitation and vegetation type and density (distributed by watershed aspect). The Model then computes the amount of water potentially available for runoff. The water balance of the WRENSS Model is coupled with a snowmaking hydrology computation process developed through the CSCUSA study. Together, these calculations produce estimates of water yield typical of subalpine mountain watersheds. For each study watershed, the WRENSS Model distributes the calculated annual yield using simulated hydrographs based on hundreds of years of data recorded at several different gauging stations. The simulated hydrographs represent the normalized distributions of the annual yield in six-day intervals throughout the year. It is important to note that the computations do not include routing of runoff water through the watershed to the stream system. Thus, the water yield hydrographs do not represent streamflow per se, but rather basin-wide water yield to the receiving waters. In other words, the WRENSS hydrologic model was developed to simulate expected changes in streamflow as the result of silvicultural activities, not streamflow itself.

---

<sup>101</sup> State of Colorado CDPHE, 2012

<sup>102</sup> EPA, 1980; Troendle et al., 2003; Colorado Ski Country USA, 1986

**Table 3I-1:  
Study Watersheds Description**

<b>Watershed</b>	<b>Area (acres)</b>	<b>Stream Channels</b>
Watershed #1	870	One perennial stream channel of second-order, approximately 3,030' long. Several perennial stream channels of first-order, approximately 13,640' in total length. Several intermittent channels, approx. 3,300' in total length.
Watershed #2	250	Three perennial stream channels of first-order, approximately 2,400' in total length. One intermittent channel, approximately 1,150' long.
Watershed #3	260	Two perennial stream channels of first-order, approximately 2,600' in total length. Two intermittent stream channels, approximately 875' in total length.
Watershed #4	365	Several seeps and small streams were observed flowing into North Fork Snake River, but no survey information is available.

Water yields and distribution hydrographs were modeled for baseline, existing, and proposed conditions using monthly average precipitation and temperature data for each watershed. The purpose of this modeling effort is to estimate the effects of existing and potential projects on the watersheds' yield and peak flow. The baseline hydrographs modeled conditions prior to any human impacts, such as ski trail development, taking place in these watersheds.

Under current conditions, yields of Watersheds #1 and #2 are affected by tree removal associated with ski area development and by the input of additional water in the form of snowmaking (see Table 3I-2). Water yields (expressed in acre feet) and peak flows (in cubic feet per second [cfs]) calculated using the WRENSS Model for each study watershed are summarized in Table 3I-3, for both baseline and current conditions assuming average precipitation and temperatures. Hydrograph plots that depict the temporal distribution of these water yields were also developed using the WRENSS Model. These modeled hydrographs reveal flow characteristics reflective of the current ski trail system and snowmaking applications existing in Watershed #1. In general, snowmelt hydrographs influenced by vegetative clearing and snowmaking have higher intensity peak flows which occur earlier in the runoff season as compared to pre-development conditions. This is a consequence of the higher volume and rate of snowmelt due to decreased canopy interception and evapotranspiration, and increased solar radiation in cleared areas, and also due to the snowmaking water input (additional to natural precipitation) to the affected watersheds.

**Table 3I-2:  
Study Watersheds – Existing Conditions**

<b>Watershed</b>	<b>Surface Area (acres)</b>				
	<b>Total</b>	<b>Above Tree Line</b>	<b>Forests</b>	<b>Cleared</b>	<b>Snowmaking</b>
Watershed #1	870	720	150	86	117.2
Watershed #2	250	64	186	7.4	3.3
Watershed #3	260	115	145	0	0
Watershed #4	365	30	330	0	0

**Table 3I-3:  
WRENSS Model Output for Baseline and Existing Conditions – Average Precipitation**

Watershed	Baseline Conditions		Existing Conditions	
	Water Yield (acre feet)	Peak Flow (cfs)	Water Yield (acre feet)	Peak Flow (cfs)
Watershed #1	1,494.1	14.3	1,632.3	20.5
Watershed #2	289.0	2.1	304.5	3.6
Watershed #3	395.7	3.1	395.7	3.1
Watershed #4	288.5	2.0	288.5	2.0

The modeled values of yield and peak flow presented above were computed using average conditions of precipitation and temperature. Watershed yield and peak flow can vary significantly from year to year due to natural variability of precipitation patterns. WRENSS computations completed for other ski area watershed in the Central Rocky Mountains of Colorado show that the modeled yield can increase by 30 to 50 percent if the annual precipitation is assumed to be 20 percent higher than average conditions (i.e., a typical “wet year” condition).<sup>103</sup> Similarly, assuming a dry year condition when annual precipitation is 80 percent of the average, the computed watershed yield was found to be between 60 and 70 percent of the average year yield.

### *Stream Health*

#### Stream Health Definitions

The WCPH defines stream health as the condition of a stream compared to the condition of a minimally disturbed reference stream of similar type and geology. Stream health is categorized as robust, at-risk, or diminished using numerical criteria for metrics such as percent of fine sediment, percent of unstable banks, residual pool depths, and occurrence of large wood debris. The stream health classification is obtained by comparing metrics surveyed in a study reach against those surveyed in its corresponding reference reach. Reference stream reaches are located in watersheds with little or no development and represent natural conditions that are attainable for a given channel type, climate, geology, aspect, and slope. Reference stream reaches provide an analytical control against which to compare the conditions found in study reaches. Study reaches are located downstream from areas impacted by natural events (e.g., forest fires) or activities such as logging and ski area development.

Stream health classes are used for assessing long-term stream health and impacts from management activities. For example, Management Measure (3) states that “only those actions that maintain or improve long-term stream health and riparian ecosystem condition” shall be allowed. Definitions of relevant stream health metrics are listed below. Table 3I-4 summarizes the definitions of stream health classes.

<sup>103</sup> Resource Engineering, Inc., 2014

**Table 3I-4:  
Stream Health Classes for Attainment of Forest Plan Standards (WCPH)**

Stream Health Class	% of Reference	Habitat Condition
Robust	> 74 or < 126 <sup>a</sup>	Stream exhibits high geomorphic, hydrologic and/or biotic integrity relative to its natural potentials condition. Physical, chemical and/or biologic conditions suggests that state assigned water quality (beneficial, designated or classified) uses are supported.
At-Risk	59 to 73 or 127 to 141 <sup>a</sup>	Stream exhibits moderate geomorphic, hydrologic and/or biotic integrity relative to its natural potential condition (as represented by a suitable reference condition). Physical, chemical and/or biologic conditions suggest that state assigned water quality (beneficial, designated or classified) uses are at risk and may be threatened.
Diminished	< 58 or > 141 <sup>a</sup>	Stream exhibits low geomorphic, hydrologic and/or biotic integrity relative to its natural potential conditions (as represented by a suitable reference condition). Physical, chemical and/or biologic conditions suggest that state assigned water quality (beneficial, designated or classified) uses may not be supported.

*Note:*

<sup>a</sup> For metrics that increase with decreasing stream health, such as fine sediment and unstable stream banks.

### Potential Management Effects to Stream Health

#### **Metric:**

*Unstable Banks:* A streambank showing evidence of the following: breakdown (clumps of bank are broken away and banks are exposed); slumping (banks have slipped down); tension cracking or fracture (a crack visible on the bank); or vertical and eroding (bank is mostly uncovered, less than 50 percent covered by perennial vegetation, roots, rocks of cobble size or larger, logs of 0.1 meter in diameter or larger, and the bank angle is steeper than 80 degrees from the horizontal). Undercut banks are considered stable unless tension fractures show on the ground surface at the back of the undercut.<sup>104</sup>

#### **Causal Mechanism(s):**

*Increased Runoff:* The WCPH lists increased runoff as one the major sources of stream impacts. Several investigators have demonstrated that increases in peak discharge and annual volume of runoff can negatively impact the stability of streambanks.<sup>105</sup>

*Impacts to Riparian Vegetation:* Many land use activities can lead to accelerated bank erosion. Riparian vegetation provides internal bank strength. Removal of native riparian vegetation may lead to weakened internal bank strength and subsequent decrease in bank stability.<sup>106</sup>

*Channel Network Extension:* Roadside drainages frequently connect directly to the stream channel and result in a net increase in the length of the existing channel network within the watershed. This increases the efficiency of flow routing within the watershed, increasing peak flows and subsequent erosion and

<sup>104</sup> Overton et al., 1997

<sup>105</sup> David, 2008

<sup>106</sup> Rosgen, 2006

sediment transport. The WCPH outlines the following PDC under Management Measure 1: “In each third-order and larger watershed, limit connected disturbed areas so that the total stream network is not expanded by more than 10 percent. Progress toward zero connected disturbed area as much as feasible.” Roads are usually a primary source of channelized connection between disturbed soils and the stream channel. Because roadside drainage ditches provide an efficient mechanism for capturing runoff and frequently drain to a stream system, a direct link between the road-generated sediment source and the stream system is easily created. A second potential source of connected disturbance could be sparsely vegetated ski trails with drainage waterbars that connect directly to the stream system.

*Connected Graded Terrain:* In terms of the effect of proposed management activities upon bank stability conditions in affected stream reaches, ultimately the area of disturbance and/or snowmaking that is directly connected to the stream system is the variable of management concern. The WCPH clearly documents the relationship between CDAs and effects to peak flows in the associated stream system. Likewise, the effect of channel network extension and the increased efficiency of hydraulic routing have been well documented by several investigations, including references in the Zero Code of the WCPH.<sup>107</sup>

**Metric:**

*Percent Fine Sediments:* The effect of land disturbances such as roads, roadside ditches, ski trails, and utility corridors within forested watersheds tend to cause an increase in exposed and compacted surface soils and, therefore, increase erosion and sediment transport. An increase of sediment load input to the stream network of a watershed is often indicated by higher percentages of fine-grained particles on the channel bed. Fine sediment deposition can diminish habitat by aggradation, or filling in, of pool systems. Pools are important components of habitat for many fish species and other aquatic organisms. Filling by fines affects pool habitat by reducing volume, particularly during low flow conditions, and obliterating substrate cover.

**Causal Mechanism(s):**

*CDA:* High-runoff areas, like roads and other disturbed sites, having a continuous surface flow path into a stream or lake. Hydrologic connection exists where overland flow, sediment, or pollutants have a direct route to the channel network. CDAs include roads, ditches, compacted soils, bare soils, and areas of high burn severity that are connected to the channel system. Ground disturbing activities located within the WIZ should be considered connected unless site-specific actions are taken to disconnect them from the streams. CDAs provide a measure of the extent to which a stream reach is influenced by direct, channelized connections between disturbed soils and the stream network itself.

**Metric:**

*Wood Frequency:* Sustainable woody debris recruitment is recognized as an important riparian function in mountain channels. Standing dead trees provide habitat for nesting species in the riparian zone and

---

<sup>107</sup> Burroughs and King, 1989; Troendle and Olsen, 1994

contribute detritus and insects to streams. Once in streams, coarse woody debris helps maintain channel structure by storing sediment and encouraging pool scour. Large woody debris (LWD) reduces stream energy by interrupting the continuous slope of channel beds and creating turbulence. In streams supporting fisheries, LWD also helps provide stable fish habitat by retaining spawning gravel and by serving as rearing cover.

**Causal Mechanism(s):**

*Vegetation Removal in WIZ:* Recruitment of LWD is dependent upon maintenance of riparian vegetation structure and function. Removal of vegetation within the WIZ has been demonstrated to have a negative impact upon maintenance of adequate wood frequency.

**Existing Stream Health**

The WRNF evaluates stream health using a standard Forest Service physical habitat survey protocol.<sup>108</sup> Under this protocol, streams that may be affected by proposed management activities are surveyed and compared to reference streams with similar morphology and geology. Reference streams represent natural conditions that are considered the best conditions attainable. For streams that are third-order or larger, stream health surveys are typically conducted downstream from proposed land treatments, in reaches that are considered to have the potential to respond to altered flow conditions or sediment loading upstream.<sup>109</sup> Quantitative stream health surveys are not routinely conducted on second or first-order streams due to high variability in bed and bank characteristics; however, these smaller streams are often evaluated using qualitative observations of bed and bank characteristics which may indicate localized erosion or sediment storage.

As described in the paragraphs above, disturbance in the WIZ has a direct effect on stream health metrics, such as LWD and percent fine sediments. The WCPH states the importance of the WIZ in the protection of interacting aquatic, riparian, and upland functions. Furthermore, Management Measure 3 includes PDC requiring that new concentrated use sites be located outside of the WIZ if practicable. Table 3I-5 compares the extent of the WIZ estimated for baseline and existing conditions.

**Table 3I-5:**  
**Impacts to WIZ – Existing Conditions**

<b>Watershed</b>	<b>Baseline WIZ (acres)</b>	<b>Existing WIZ (acres)</b>	<b>Existing Impact to WIZ</b>
Watershed #1	84.9	23.1	73%
Watershed #2	15.2	15.2	0%
Watershed #3	17.5	17.5	0%
Watershed #4	0	0	0%

---

<sup>108</sup> Overton et al., 1997

<sup>109</sup> Montgomery and Buffington, 1998

A stream health survey completed for a reach of North Fork Snake River near A-Basin, shows a robust classification for the percent fine sediments, residual pool depth, and LWD metrics.<sup>110</sup> Unstable banks, however, were classified as at-risk. This could be a consequence of higher peak streamflows resulting from ski area development on Watershed #1 and from the close proximity of Highway 6 to North Fork Snake River. Additionally, qualitative assessments of the second- and first-order streams in the study watersheds were conducted on August 28 and September 4, 2015. The perennial and intermittent stream channels observed in Watersheds #1, #2, and #3 were found to be in good condition; stream banks were deemed stable and no indications of sediment loading into the stream were observed. Table 3I-6 shows the results of the health survey completed for North Fork Snake River just downstream from the study watersheds.

**Table 3I-6:  
Stream Health Summary for North Fork Snake River downstream from A-Basin**

Metric	Class Threshold			North Fork Snake River observed Value	Stream Health Class
	Robust	At-Risk	Diminished		
Percent Fine Sediments	<11%	≤13%	>13%	7.6%	Robust
Residual Pool Depth	>0.23	≥0.18	<0.18	0.25	Robust
Unstable Banks	<14	≤15.8	>15.8	14.9	At-Risk
Large Woody Debris (per 100 m of channel)	>6	≥5	<4	7	Robust

### Existing Connected Disturbed Areas

A field investigation was completed in late summer and early fall days of 2015 to document the condition of roads and other disturbed areas within the study watersheds, particularly in the vicinity of stream channels. Data collected during the field investigation includes the location and characteristics of roads, road-side ditches, culverts, and waterbars. The spatial location of these features was collected using a global positioning system and incorporated into a geographic information system (GIS) database. An analysis of the field data with GIS tools provided an estimation of the spatial location and extent of CDA in the study watersheds.

The A-Basin mountain roads were found to be in good condition. However, sections of these roads were found to be connected to the stream channel network and thus classified as CDA (e.g., road-side ditches discharging directly into the stream). As discussed above, the WCPH provides management measures to protect the hydrologic function of watersheds. For example, PDC included in Management Measure 1 states that *“In each watershed containing a third-order and larger stream, limit connected disturbed areas so the total stream network is not expanded by more than 10 percent.”* Direct connection of disturbances to the stream channel, such as direct discharge of road-side ditches into the stream, results in a net increase of the length of the channel network within the watershed. Although the study watersheds

<sup>110</sup> Anderson, 2015

are of first- and second-orders, they are tributaries to North Fork Snake River, a larger order watershed, and the concept of minimizing the length of connected roads applies. Connected disturbed areas intercept and concentrate surface runoff, which would otherwise infiltrate and/or be consumed by the baseline vegetation, increasing yield and peak streamflows. Additionally, this creates a direct link between sediment generated in disturbed areas and the stream channels. As a result, CDA have a negative impact in stream health metrics such as unstable banks and percent of fine sediments. Tables 3I-7 and 3I-8 display a summary of the CDA analysis completed for the A-Basin study watersheds.

**Table 3I-7:**  
**Roads Connected to the Stream Network – Existing Conditions**

<b>Watershed</b>	<b>Length of Stream Channel Network <sup>a</sup> (feet)</b>	<b>Length of Connected Roads (feet)</b>	<b>Percent Increase of Channel Network (%)</b>
Watershed #1	19,974	1,217	6
Watershed #2	3,531	268	8
Watershed #3	3,473	0	0
Watershed #4 <sup>b</sup>	ND	0	0

*Notes:*

<sup>a</sup> Derived from GIS and field data analysis; includes stream channels of order 1 and higher.

<sup>b</sup> No perennial or intermittent streams observed in this watershed.

**Table 3I-8:**  
**Connected Disturbed Areas – Existing Conditions**

<b>Watershed</b>	<b>Graded Areas<sup>a</sup> (acres)</b>	<b>CDA (acres)</b>	<b>Percent Graded Areas that are Connected (%)</b>
Watershed #1	8.5	0.45	6
Watershed #2	1.0	0.07	7
Watershed #3	0.0	0.00	0
Watershed #4	0.0	0.00	0

*Note:*

<sup>a</sup> Derived from field observations and GIS analysis; mostly mountain roads and lift terminals.

Table 3I-7 shows that the increase in the length of channel network due to connected roads is relatively low. In fact, the percent increase of channel length is lower than the 10 percent limit established in Management Measure 1. The acreage of graded areas that are connected to the streams is also relatively low (see Table 3I-8). In summary, the overall good condition of the A-Basin mountain roads and the small acreage of CDA have likely contributed to maintain the “robust” classification for percent of fine sediments and residual pool depth metrics.

## DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

### Alternative 1 – No Action

Current winter and summer uses at A-Basin would continue under the No Action Alternative. No new grading or vegetation removal would occur under this alternative; therefore, the No Action Alternative would have no direct or indirect effects on streams and riparian resources.

### Alternative 2 – Proposed Action

Construction of the projects proposed under Alternative 2 would require that 24.8 acres of existing forested areas be cleared. Additionally, between 20 and 25 percent of existing trees would be removed within 48 acres to create tree skiing trails. A total of 8.3 acres of terrain grading would also be needed to construct the proposed projects. Table 3I-9 summarizes the tree clearing and terrain grading proposed under Alternative 2. Table 3I-10 displays a comparison between baseline (pre-development), existing, and proposed forest acreages.

**Table 3I-9:  
Summary of Proposed Projects per Watershed**

Watershed	Proposed Projects			
	Project Name	Tree Clearing (acres)	Tree Thinning (acres)	Terrain Grading (acres)
Watershed #1	Zuma Access surface lift; Molly Hogan chairlift replacement; Pallavicini chairlift replacement; Beavers chairlift; Beavers Trails; Beavers Bowl; Canopy Tour; Challenge Course	2.0	0.0	4.9
Watershed #2	Beavers Trails; Steep Gullies; Upper and Lower Egress Traverses; Emergency Egress Route; Pallavicini chairlift replacement	3.7	0.0	0.6
Watershed #3	Beavers Trails and Tree skiing; Beavers Bowl; Steep Gullies; Beavers chairlift	13.8	29.8	2.7
Watershed #4	Beavers Trails and Tree skiing; Beavers Bowl; Steep Gullies	5.3	18.3	0.0
<b>TOTAL</b>		<b>24.8</b>	<b>48.1</b>	<b>8.3</b>

*Note: acreages may differ slightly from the numbers presented in Chapter 2 of this document due to rounding.*

**Table 3I-10:  
Comparison of Existing and Proposed Forest Clearing<sup>a</sup>**

Watershed	Baseline Forest (acres)	Existing Clear-Cut		Proposed Clear Cut	
		Surface Area (acres)	Percent of Baseline (%)	Surface Area <sup>b</sup> (acres)	Percent of Existing (%)
Watershed #1	235.65	85.95	36	1.96	1.3
Watershed #2	192.95	7.37	4	3.72	2.0
Watershed #3	148.35	0.00	0	20.15	13.6
Watershed #4	331.11	0.00	0	8.93	2.7

Notes:

<sup>a</sup> Acreages may differ slightly from the numbers presented in Chapter 2 of this document due to rounding.

<sup>b</sup> Includes proposed thinning.

### Water Yield

Various investigations have concluded that increases in water yield and peak streamflows are generally undetectable when tree removal acreage represents less than 25 percent of the existing forested area.<sup>111</sup> This finding is consistent with computations conducted with the WRENSS model for the study watersheds under the Proposed Action condition. The WRENSS model computed increases in water yield and peak streamflow between 0 and 10 percent relative to existing conditions for all the study watersheds, where the proposed tree clearing ranges between 1 and 14 percent. Such small changes are well within the naturally variability of water yield and peak flows due to varying climatic patterns (see discussion under the Affected Environment section, above). Tables 3I-11 and 3I-12 shows the computed changes in water yield and peak streamflows.

**Table 3I-11:  
Estimated Changes to Watershed Yield**

Watershed	Watershed Yield (acre feet)			Change Relative to Existing Condition
	Baseline	Existing	Proposed	
Watershed #1	1,494.10	1,632.3	1,634.1	0%
Watershed #2	289.04	304.5	311.7	2%
Watershed #3	395.73	395.7	419.2	6%
Watershed #4	288.48	288.5	300.8	4%

<sup>111</sup> Anderson, 2015; Jones and Grant, 1996; Troendle and King, 1986

**Table 3I-12:  
Estimated Changes to Peak Flow**

Watershed	Peak Flow (cfs)			Change Relative to Existing Condition
	Baseline	Existing	Proposed	
Watershed #1	14.3	20.5	20.5	0%
Watershed #2	2.1	3.6	3.7	2%
Watershed #3	3.1	3.1	3.4	10%
Watershed #4	2.0	2.0	2.2	5%

### *Stream Health*

#### Impacts to WIZ

As discussed in Stream Health within the Affected Environment section, the North Fork Snake River just downstream from the study watersheds has been rated as robust for the percent fine sediments, residual pool depth, and LWD metrics, and as at-risk for unstable banks. The Proposed Action would involve tree removal and terrain grading within the study watersheds, including in the WIZ (see Table 3I-13).

Management Measure 3 states that only those projects that maintain or improve long-term stream health should be allowed in the WIZ of perennial and intermittent streams. Tree clearing and terrain grading within the WIZ can negatively affect stream health. However, negative effects of the relatively small WIZ acreage that would be impacted by the proposed activities could be minimized or avoided by implementing adequate PDC. Table 2-2 in Chapter 2 of this document outlines PDC to avoid or minimize potential impacts to the water resources of the study watersheds.

#### Connected Disturbed Areas

Terrain grading has the potential to impact stream health metrics such as unstable banks and percent fine sediments if graded areas are connected to the stream network. PDC were developed to avoid an increase in the acreage of CDA. Specifically, PDC listed in Table 2-2 require site visits to be conducted by A-Basin and Forest Service personnel to *“field-fit and flag areas to be graded in the vicinity of stream channels to ensure tree removal and grading in the WIZ is minimized to the extent possible.”* Based upon observations and data collected during the field review, site-specific grading and erosion control plans will be developed by A-Basin for review and approval by a Forest Service Hydrologist and/or Soil Scientist. In addition, the field investigation conducted in August and September of 2015 identified opportunities to disconnect 0.52 acre of existing CDA by implementing relatively simple improvements to mountain road drainage. The following will disconnect approximately 1,485 linear feet of mountain roads and CDA.

- At approximately 550 feet from the gate near Highway 6, the road-side ditch flows into a 24-inch culvert which discharges directly into a stream tributary to the North Fork Snake River. Disconnect the road and ditch from the stream system by implementing the following BMP for erosion and sediment control:

- Properly install and maintain three rock check dams in the ditch, immediately before the culvert, and at 25 and 50 feet upstream; construct the check dams with Type L riprap (D50 = 9”).
- A 240-foot long section of road-side ditch just above the second switch-back (approximately 1,370 feet from the gate) drains directly into a small tributary to North Fork Snake River. Disconnect the road and ditch from the stream system by implementing the following BMPs for erosion and sediment control:
  - Design, construct and maintain a sediment trap at the discharge of the road-side ditch to detain sediment before it reaches the stream. Inspect the sediment trap at least once annually; remove and properly dispose accumulated sediment as required.
  - Properly install and maintain two rock check dams in the ditch, at 25 and 50 feet upstream from the sediment trap; construct the check dams with Type L riprap (D50 = 9”).
- A perennial stream tributary to North Fork Snake River crosses under the mountain road through a 48-inch culvert about 2,050 feet from the gate. The adjacent road-side ditch discharges directly into the stream. Disconnect the road and ditch from the stream system by implementing the following BMPs for erosion and sediment control:
  - Design, construct and maintain a sediment trap at the discharge of the road-side ditch to detain sediment before it reaches the stream. Inspect the sediment trap at least once annually; remove and properly dispose accumulated sediment as required.
  - Properly install and maintain two rock check dams in the ditch, at 25 and 50 feet upstream from the sediment trap; construct the check dams with Type L riprap (D50 = 9”).

**Table 3I-13:**  
**Impacts to WIZ under the Proposed Action**

<b>Watershed</b>	<b>Baseline WIZ (acres)</b>	<b>Existing WIZ (acres)</b>	<b>Proposed Tree Removal (acres)</b>	<b>Percent of Existing WIZ (%)</b>	<b>Proposed Grading (acres)</b>	<b>Percent of Existing WIZ (%)</b>
Watershed #1	84.87	23.14	0.46	2	0.43	2
Watershed #2	15.19	15.19	0.87	6	0.00	0
Watershed #3	17.45	17.45	1.58	9	0.00	0
Watershed #4	NA	NA	0.00	NA	0.00	NA

### *Forest Plan Consistency*

The relatively small areas of proposed terrain grading and vegetation removal would not produce a detectable increase in watershed yields or peak streamflows. However, the proposed projects would require adequate implementation of the PDC listed in Table 2-2 in order to “maintain or improve” stream

health as required by the WCPH. These PDC were developed as a result of the analysis of potential impacts to the watershed resources and in coordination with the Forest Service. Correct implementation of the required PDC and proper design, installation, and maintenance of associated BMPs for sediment and erosion control would ensure consistency with the WCPH and would not adversely impact the health of the study watersheds and North Fork Snake River.

## **CUMULATIVE EFFECTS**

### **Scope of the Analysis**

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of water resources extend from A-Basin's inception as a ski area, through the foreseeable future in which the ski area can be expected to operate.

#### *Spatial Bounds*

The impacts on stream and riparian resources affected by A-Basin's activities are most evident in the watersheds located within the ski area's SUP (the study watersheds) and in the reach of North Fork Snake River immediately downstream from these watersheds. Downstream from A-Basin the North Fork Snake River and its tributaries are relatively free of additional anthropogenic impacts, except the potential impacts of Highway 6, until its confluence with the Snake River, just upstream from Keystone Resort. Therefore, the spatial boundary for the cumulative effects analysis of stream and riparian resources is defined at a point on the North Fork Snake River just upstream from the confluence with the Snake River.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area and County development projects have been incorporated and analyzed in this document as part of the Affected Environment. The following projects could have cumulative impacts on social and economic resources and are analyzed below:

- A-Basin MDP Update
- Keystone Resort Dercum Mountain Improvements Projects EA
- Keystone Resort MDP
- Continued Build-out of Summit County
- Continued Build-out of Snake River Basin
- Residential Developments in the Lower Blue River Basin
- 2011 Keystone Ski Area Forest Health Project
- WRNF Forest Plan – 2002 Revision

The WRNF has recently assessed the condition of the North Fork Snake River watershed, following the Watershed Condition Framework Implementation Guide.<sup>112</sup> The assessment rated the watershed as “Functioning Properly,” based upon analysis of twelve indicators of watershed condition (see Table 3I-14). This important finding would be expected since little development has occurred in the 10,240-acre North Fork Snake River watershed. In particular, cumulative effects are usually observed in watersheds where land treatments associated with ski area development (such as ski trail construction and snowmaking operations) have been implemented. These cumulative effects have been demonstrated to have a direct correlation to increases in the magnitude and duration of snowmelt runoff. Although the North Fork Snake River watershed is currently rated as “Functioning Properly,” A-Basin’s activities would continue to require adequate management of mountain drainage. This includes maintenance and improvement of the ski area’s mountain roads, road-side ditches, and parking lots. Future implementation of projects would require site specific analyses in order to avoid or minimize additional impacts.

**Table 3I-14:**  
**North Fork Snake River Watershed – Condition Indicators**

<b>Indicator</b>	<b>Condition</b>
Aquatic Biota	Poor
Riparian/Wetland Vegetation	Good
Water Quality	Good
Water Quantity	Good
Aquatic Habitat	Good
Roads and Trails	Fair
Soils	Good
Fire Regime or Wildfire	Good
Forest Cover	Good
Forest Health	Good
Terrestrial Invasive Species	Good
Rangeland Vegetation	Good

Considering the effects of past, present, and reasonably foreseeable future actions, Alternative 1 would not cumulatively affect the watershed resources. Construction of the projects proposed under Alternative 2 would maintain stream health through successful implementation of PDC outlined in Table 2-2 of this report. By maintaining the health of the study watersheds and North Fork Snake River, the Proposed Action would not exhibit cumulative impacts upon water resources.

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Although vegetation removal within the WIZ would occur with implementation of the proposed projects, long-term impacts to stream and riparian resources are not expected to occur as result of the Proposed

---

<sup>112</sup> USDA Forest Service, 2011

Action, as it includes PDC that would maintain or improve stream health. No irreversible or irretrievable commitments of stream and riparian resources associated with the Proposed Action have been identified.

## **J. WETLANDS**

### **SCOPE OF THE ANALYSIS**

A-Basin is located within the Snake River watershed, which flows into Dillon Reservoir. The Analysis Area is 995 acres in size and encompasses the front side of the existing ski area, as well as the proposed lift-serviced ski terrain in the Beavers and Steep Gullies areas. Approximately 76 acres of wetlands were mapped in the Analysis Area. Detailed wetland mapping efforts focused on areas that would have potential disturbance, including all the proposed actions. The wetland and riparian habitats described are based on field observation within the Analysis Area; however, these descriptions are typical of the wetland and riparian habitats found across A-Basin's SUP area. For a more detailed discussion of wetlands assessment in the Analysis Area, refer to the Wetland Specialist Report in the project file.<sup>113</sup>

### **FOREST PLAN DIRECTION**

Pursuant to the Forest Plan, as amended, soils, aquatic and riparian system management measures and design criteria are provided in the R2 WCPH to ensure applicable federal and state laws are met on NFS lands in R2.<sup>114</sup>

#### **Applicable WCPH Management Measures**

##### *Hydrologic Function*

- 11.1 Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.

##### *Riparian Areas and Wetlands*

- 12.1 In the WIZ next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.
- 12.3 Conduct actions so that stream pattern, geometry, and habitats maintain or improve long-term stream health.
- 12.4 Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.
- 12.6 Manage water use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.

---

<sup>113</sup> Western Ecological Resource, 2016

<sup>114</sup> USDA Forest Service, 2002a and 2006

## **EXECUTIVE ORDER 11990**

Additional direction regarding wetlands management for the USACE and Forest Service is provided by EO 11990 – Protection of Wetlands. This EO requires federal agencies to avoid to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, EO 11990 directs federal agencies to avoid new construction in wetlands unless there is no reasonable alternative. EO 11990 states further that where wetlands cannot be avoided, the Proposed Action must include all practicable measures to minimize harm to wetlands. As required by EO 11990 and Section 404 of the CWA, avoidance and minimization measures must be considered through the planning process. Therefore, this section also identifies planning constraints with regard to terrain development.

## **AFFECTED ENVIRONMENT**

### **Wetland Descriptions**

In total, approximately 76 acres of wetlands occur within the 995 acre Analysis Area, including 15 acres of forested wetlands, 55 acres of scrub-shrub wetlands, and 6 acres of emergent wetlands. In addition, there is a 0.4-acre pond located between the Lenawee Mountain and Norway chairlifts. Figure 1 illustrates the wetlands within the Analysis Area. For more detailed wetland maps, refer to the Wetland Specialist Report.<sup>115</sup>

Riparian and wetland habitats occur primarily along the North Fork Snake River and in the eastern portion of the Analysis Area below the East Wall of Lenawee Mountain. In addition, there are small scattered seeps in the Beavers Bowl area. High quality wetland fens were also observed. Brief vegetation, soil, and hydrology descriptions of the riparian and wetland habitats are provided below. The attribute table associated with the GIS shapefile for wetlands is in the project file and contains greater detail on the vegetation of each wetland.

The hydrology of wetlands within the Analysis Area is primarily provided by groundwater, with a smaller contribution from surface water flowing into and through the wetlands. The groundwater system is fed by precipitation recharge that occurs on high mountain peaks and ridges to the south and east. Most of the precipitation in the Analysis Area occurs as snowfall, and total precipitation averages 20.4 inches annually.<sup>116</sup> In addition, snowmaking activities may increase the snowfall depths within some locations of the Analysis Area. As snowmelt occurs, generally between April and June, meltwater moves downward through the glacial till and colluvium, toward the underlying bedrock. When the groundwater encounters this less permeable bedrock, it is diverted to the land surface, forming springs, seeps and small intermittent streams. Perennial streams such as the North Fork Snake River convey surface water which produces saturated soil conditions along the stream banks and on adjacent floodplains, where present.

---

<sup>115</sup> Western Ecological Resource, 2016

<sup>116</sup> NCDC, 2014

Finally, runoff from summer rains and pooled snowmelt are additional surface water sources to the wetland systems of the Analysis Area.

### *Forested Wetlands*

Forested wetlands occur along the North Fork Snake River and at various seep/spring complexes. These are characterized by an overstory of Engelmann spruce and subalpine fir, with an understory of chiming bells (*Mertensia ciliata*), arrowleaf groundsel (*Senecio triangularis*), heartleaf bittercress (*Cardamine cordifolia*), Fendler cowbane (*Oxypolis fendleri*), bishop's cap (*Mitella pentandra*), brook saxifrage (*Micranthes odontoloma*), softleaf sedge (*Carex disperma*), and millet wood rush (*Luzula parviflora*).

### *Scrub-Shrub*

Wetlands scrub-shrub wetlands, which are most prevalent below the East Wall, are comprised of planeleaf and bareground willows (*Salix planifolia*, *S. brachycarpa*) with an understory of marsh marigold (*Psychrophila leptosepala*), queen's crown (*Clementsia rhodantha*), water sedge (*Carex aquatilis*), and heartleaf bittercress.

### *Herbaceous Wetlands*

Herbaceous wetlands within the Analysis Area have a variable vegetation composition. Snowmelt basin wetlands tend to be dominated by black alpine sedge (*Carex nigracans*), while herbaceous wetlands along small streamlets and seeps are dominated by brook saxifrage, arrowleaf groundsel, splitleaf Indian paintbrush (*Castilleja rhexifolia*), Parry's primrose (*Primula parryi*), elephant's head (*Pedicularis groenlandica*), monkey flower (*Mimulus guttatus*), Fendler cowbane, and saffron butterweed (*Packera crocata*). Those herbaceous wetlands in ski trails that have been historically disturbed by grading support a variety of herbaceous or small wetland shrubs along with non-native opportunistic species, such as redtop (*Agrostis gigantea*) and meadow foxtail (*Alopecurus pratensis*).

### *Wetland Fens*

A total of 1.6 acres of fens were mapped within the Analysis Area. Fens are wetlands characterized by the accumulation of organic-rich soils and are primarily fed by groundwater sources. Fen soils are Histosols, characterized by more than 40 cm (16 inches) of organic matter accumulation, commonly referred to as peat. Because the rate of accumulation of peat in fen is so slow, these ecosystems are generally considered to be irreplaceable. Fens are most well-developed in the vicinity of the existing snowmaking storage reservoir, located at the northern end of the Analysis Area, and fens also occur along the Little Snake River west of the base of the ski area.

The fen vegetation is characterized by a mosaic of shrubby and herbaceous plant communities with bog birch (*Betula glandulosa*), planeleaf willow, water sedge (*Carex aquatilis*), marsh marigold, tufted hairgrass (*Deschampsia caespitosa*), hemlock parsley (*Conioselinum scopulorum*), elephant's head, green bog orchid (*Platanthera huronensis*), northern bog sedge (*Carex gynocrates*), white violet (*Viola renifolia*), millet woodrush (*Luzula parviflora*), and peatmoss (*Sphagnum* sp.).

### **Wetland Functions and Values**

Wetlands are often described in terms of their functions and values. Functions refer to the ecological role or processes that a wetland performs. Values refer to the importance of these functions to the environment or to humans. However, these terms are interrelated and most often the distinction between functions versus values is not made. Wetland functions can be generally categorized into three major groups: hydrology, water quality, and habitat. Wetlands do not necessarily perform all functions nor do they perform all functions to the same degree. The location, vegetation, and hydrology of a wetland often determine which functions it performs.

The major wetland functional groups which are evaluated in this document include: hydrology functions (groundwater discharge, groundwater recharge, velocity reduction, erosion protection, and floodwater retention/peak flood reduction); water quality functions (sediment removal, nutrient retention and removal); and wildlife habitat functions.

The qualitative assessments of wetland functions presented here are based on best professional judgment and knowledge of the wetlands within the Analysis Area. In general terms, these assessments rank the effectiveness of a function by considering both the presence of a particular process, as well as the opportunity for that process to occur based on the wetland type, location and overall relative condition. The assessments represent average conditions for each group of wetlands or wetland complex. A summary of the ranking system is presented below in Table 3J-1, and detailed descriptions of the functions and values for the wetlands within the Analysis Area are found below.

**Table 3J-1:  
Qualitative Wetland Assessment Rankings**

<b>Ranking</b>	<b>Description</b>
None	Available observations and/or data confirm absence or prevention of a function
Low	Short duration, small volumes of water, or absence of opportunity cause the function to be insignificant
Moderate	The combined effects of size, frequency, and opportunity indicate the function occurs regularly but is not high quality or the dominant function
High	Function is very effective, because the wetland covers a large area and/or receives a large volume of water, there is a long duration, or it provides an unusual quality
Very High	Extremely significant function owing to its uniqueness, size, duration, and opportunity

#### ***East Wall Wetlands***

Approximately 59 percent of the wetlands within the A-Basin SUP occur below the East Wall in the vicinity of the lower sections of the Lenawee Mountain and Norway chairlifts. These wetlands are primarily scrub-shrub wetlands (willow dominated), although some spruce-fir forested and herbaceous wetlands to occur. The wetlands occur along small (i.e., 2 feet wide) perennial or intermittent streams that flow into the North Fork Snake River. Water for these wetlands is provided by a high groundwater table

associated with the small streams, as well as localized seeps. In addition, seasonal snow melt contributes to the hydrology budget of these wetlands. Overall, these wetlands and riparian habitats appear to be in proper functioning condition.

**Table 3J-2:**  
**Analysis Area Wetland Assessment Summary**

	Hydrology	Water Quality	Wildlife Habitat	Overall Condition
East Wall Wetlands	High/Moderate	Moderate	High	Good
North Fork Snake River Wetlands	High/Moderate	High	High	Good
The Beavers Wetlands	Moderate-Low/ Insignificant	Low	Moderate/Low	Good
Ponds	Low/Insignificant	Low	Moderate	Good/Fair

### *North Fork Snake River Wetlands*

Wetlands adjacent to and in the vicinity of the North Fork Snake River comprise 37 percent of all wetlands within the A-Basin SUP. These wetlands occur directly adjacent to the river and along small seeps and intermittent streams which flow into the river. Several of the wetlands are adjacent to the base area. Finally, a few of these wetlands are characterized as fens and contain deep organic soils or peat. These wetlands are primarily classified as forested and scrub-shrub wetlands, however some emergent wetlands occur as well. Overall, these wetlands and riparian habitats appear to be in proper functioning condition. However, wetlands adjacent to the base facilities, chairlifts, and the highway could potentially be threatened by erosion and sedimentation. Currently, 0.67 acre of wetlands located north of the existing snowmaking storage reservoir are being negatively impacted by sedimentation from Highway 6.

### *The Beavers Wetlands*

Wetlands occurring in the proposed Beavers expansion area comprise 4 percent of the wetlands identified in the A-Basin SUP area. The wetlands contain forested, scrub-shrub, and emergent vegetation classification types. The wetlands occur in snowmelt basins, as well as along small intermittent and perennial streams. These wetlands have no surface connection to the larger tributary system of the North Fork Snake River. Overall, the Beavers wetlands appear to be in good condition and are functioning properly.

### *Ponds*

One 0.4 acre-perennial pond occurs within the Analysis Area and is located in an alpine area between the Lenawee Mountain and Norway chairlifts. This aquatic habitat is classified as a Palustrine system with an aquatic bed class. The overall condition of this aquatic habitat appears to be good and no adverse effects from the adjacent land uses were noted during field reconnaissance.

## **DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

### **Alternative 1 – No Action**

There would be a continuation of existing management practices. There would be no new ski terrain, no new or upgraded chairlifts, and no new multi-season recreation facilities. There are no anticipated wetland impacts.

### **Alternative 2 – Proposed Action**

In accordance with EO 11990, the Proposed Action was designed to avoid and minimize impacts to wetlands wherever possible. Table 3J-3 provides a summary of the wetland impacts under the Proposed Action, and Table 2-2 identifies PDC that would be implemented. Overall, there would be 0.062 acre of unavoidable permanent wetland impacts associated with the replacement of the lower terminals for the Molly Hogan and Pallavicini chairlifts and 0.060 acre of temporary wetland impact associated with the removal of the Norway chairlift. Prior to project construction, a wetland permit from the USACE would be obtained to ensure that all criteria of Section 404 of the CWA are met.

For the summer recreation facilities (the challenge course and the canopy tour) all direct impacts to wetlands would be avoided for any ground disturbing activities, such as canopy tour stations, challenge course infrastructure and hiking paths. However, some secondary wetland impacts associated with boardwalks could potentially occur. The boardwalks would be supported with environmentally friendly helical piers and they could indirectly affect wetlands through shading. However, these impacts would be minimal (<0.01 acre in size) and would not affect wetland functions. In order to prevent any unintentional impacts, all wetlands in the vicinity of the proposed projects would be delineated and flagged by a qualified individual prior to construction. In addition, appropriate sediment control measures (e.g., straw wattles, sediment fencing) would be installed where necessary to contain sediment. Finally, construction access routes for a few of the more inaccessible canopy tour towers would occur over the snow to minimize resource impacts.

There would be no permanent or temporary wetland impacts associated with the Beavers or Steep Gullies expansion areas; however, there would be 1.53 acres of secondary wetland impacts due to overstory forest removal, willow trimming and snow compaction. Forest overstory removal may potentially affect 0.47 acre of forested wetlands for the Beavers tree skiing; however, only 20 to 25 percent of the basal tree area would be removed and hence not all of these wetlands may be affected. The emergency egress would clear a 25-foot wide corridor over a total of 0.57 acre of forested wetlands. More specifically, the western, lower end of the proposed route would cross 0.14 acre of forested wetlands in four locations that range in width from 16 to 100 feet. These wetlands contain three small (approximately 2-foot wide) perennial streams which emanate from springs located about 180 feet to 500 feet above the egress trail. These springs would not be impacted by the egress route. Further to the east, the proposed emergency egress route would cross two small spring/seep wetlands totaling 0.03 acre, 0.02 acre of forest wetland adjacent

to a fen, and 0.24 acre of a forested wetland with a small stream. Finally, the eastern portion of the emergency egress route would result in the removal of timber from an additional 0.16 acre of a forested wetland on the terrace above the North Fork Snake River. There would be no tree removal directly over any wetland fen.

Tree removal along the entire 3-acre emergency egress route would occur during the winter over a minimum 3-foot snow depth. Trees would be limbed in place and the slash would be lopped and scattered in upland areas. The tree boles would then be “skidded” out in bundles of three with a tracked snowcat. Machinery would only be used when the snow is firm and able to support the equipment. Based on an average density of 100 trees per acre, approximately 300 trees would be removed using this approach. There would be an estimated 100 trips to remove the trees over several months; however, the exact number of passes over a wetland would vary depending on the wetland’s exact location. After snowmelt, the remaining tree stumps would be flush cut and the wood appropriately treated or hauled out to reduce any potential spruce-bark beetle outbreaks.

Several PDC have been developed in coordination with the Forest Service to ensure that no ground disturbance to wetlands would occur during tree removal. However, the change in light regime could lead to a change in vegetation composition from shade loving species to sun-loving species. Appropriate monitoring post-construction would ensure that any indirect effects, if adverse, would be identified quickly and all problems quickly remedied. Because the wetlands would still remain well-vegetated after tree-removal, there is not expected to be an overall change in wetland functions or values.

The Beavers tree skiing areas would potentially affect 0.22 acre of scrub-shrub wetlands and the emergency egress and hike-back route and the upper traverse would also potentially affect 0.12 acre of scrub-shrub wetlands. These wetlands are dominated by willows (*Salix* spp.) and would likely be trimmed down in height in order to provide a safe skiing experience. Because willows are extremely resilient, this activity is not expected to negatively affect the willows and, in fact, may lead to a great shoot density over the long term.

The effect on herbaceous or emergent wetlands is variable. For example, the proposed Beavers ski trails would cross 0.13 acre of emergent wetland. As these wetlands are not currently forested, there are no anticipated effects due to adjacent forest overstory removal. A PDC would ensure that no slash or other debris is piled in wetlands and that all wetlands are adequately marked prior to construction.

**Table 3J-3:  
Wetland Impact Summary – Proposed Action**

Project Name	Wetland Class <sup>a</sup>	Permanent Impact Area (acres)	Temporary Impact Area (acres)	Secondary Impact Area (acres)
<b>CHAIRLIFT REPLACEMENTS/REMOVAL</b>				
Molly Hogan Chairlift Replacement	PSS	0.054	-	-
Pallavicini Chairlift Replacement	PSS	0.008	-	-
Norway Chairlift Removal	PSS	-	0.060	-
<b>MULTI-SEASON RECREATION FACILITIES</b>				
Canopy Tour	PEM/PSS	-	-	<0.01
Challenge Course	PEM	-	-	-
<b>BEAVERS EXPANSION AREA</b>				
Beavers Bowl	PEM	-	-	-
Beavers Trails – 100% Tree Removal	PFO	-	-	-
	PSS	-	-	-
	PEM	-	-	0.13
Beavers Tree Skiing – 20 to 25% Tree Removal	PFO	-	-	0.47
	PSS	-	-	0.22
	PEM	-	-	-
<b>STEEP GULLIES AREA</b>				
Emergency Egress Route/Hike-back	PFO	-	-	0.58
	PSS	-	-	0.12
	PEM/PSS	-	-	0.08
Upper Traverse (willow trimming)	PSS	-	-	<0.005
Tree Skiing – no tree removal		-	-	-
<b>TOTAL</b>		<b>0.062</b>	<b>0.060</b>	<b>1.60</b>

Source: Cowardin et al., 1979

Notes:

Estimation of impacts calculated with PDC applied.

PFO = Palustrine Forested, PSS = Palustrine Scrub-Shrub, PEM = Palustrine Emergent

## CUMULATIVE EFFECTS

### Scope of the Analysis

#### *Temporal Bounds*

The temporal bounds for this cumulative effects analysis of the wetlands resource extend from A-Basin's inception as a resort in 1946, through the foreseeable future in which A-Basin can be expected to operate.

#### *Spatial Bounds*

The spatial bounds for this cumulative effects analysis of wetlands is within the Analysis Area.

### **Past, Present, and Reasonably Foreseeable Future Projects**

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in the document. Past ski area development projects have been incorporated and analyzed in this document as part of the Affected Environment. Past, present, and reasonably foreseeable actions that have cumulatively affected or that are likely to affect wetland resources on WRNF and private lands within the Snake River watershed include:

- A-Basin MDP Update
- Keystone Resort MDP
- WRNF Forest Plan – 2002 Revision

Cumulatively, these projects have altered Waters of the U.S., including wetlands, within the Analysis Area resulting in reduced watershed function and value.

This EIS analyzes the potential impacts of all projects in A-Basin's MDP Update except for a new snowmaking reservoir and a zip line. A future snowmaking reservoir, if it were to occur in the base area, would impact wetlands, requiring a CWA 404 Permit and mitigation.

Projects included in the Keystone Resort MDP could alter the natural flow and volume of the Snake River watershed. The development of ski area terrain and infrastructure could cumulatively impact the wetlands resources along the Snake River watershed.

The WRNF 2002 Forest Plan includes mechanisms for the management of wetland resources forest-wide. While the 2002 Forest Plan includes numerous management prescriptions that could impact water and wetlands resources across the Forest, the application of Forest Plan standards and guidelines will ensure the water and wetlands quality is maintained or improved.

### **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

The 0.062 acre of permanent wetland impact associated with the replacement of the Molly Hogan and Pallavicini chairlifts is considered an irreversible commitment of wetland resources for that specific location. However, mitigation measures would most likely be employed through the CWA 404 permitting process and hence, overall there would be no net irreversible loss of wetlands in the Analysis Area.

The 0.060 acre of temporary wetland impacts is considered to be an irretrievable commitment of wetland resources and would likely last for approximately three to five years or until the disturbed wetlands are fully restored to their pre-disturbance condition.

# **Chapter 4**

## **Consultation and Coordination**

---

## 4. CONSULTATION AND COORDINATION

### A. PREPARERS

#### FOREST SERVICE TEAM

The following people participated in initial scoping, were members of the ID Team, and/or provided direction and assistance during the preparation of this DEIS.

Scott Fitzwilliams	White River National Forest Supervisor, Responsible Official
Bill Jackson	District Ranger, Dillon Ranger District, Line Officer
Roger Poirier	Winter Sports Program Manager, Supervisor's Office
Matt Ehrman	Project Leader/Forest Planner, Supervisor's Office
Shelly Grail-Braudis	Mountain Sports Administrator, Dillon Ranger District
Cindy Ebbert	Mountain Sports Administrator (On-Detail), Dillon Ranger District
Peech Keller	NEPA Coordinator, Dillon Ranger District (retired)
Andrea Brogan	Archaeologist, SO
Donna Graham	Landscape Architect, SO
Ashley Nettles	Wildlife Biologist, Dillon Ranger District
Matt Grove	Fisheries Biologist, Holy Cross Ranger District
Justin Anderson	Hydrologist, Supervisor's Office
Brian McMullen	Soil Scientist, Supervisor's Office

#### CONSULTANT TEAM

The use of a third party consulting firm for preparation of an EIS is addressed in the Code of Federal Regulations at 40 CFR Title 40, Part 1506.5(c). If an EIS is prepared with the assistance of a consulting firm, the firm must execute a disclosure statement, as indicated below:

*Except as provided in §§1506.2 and 1506.3 any environmental impact statement prepared pursuant to the requirements of NEPA shall be prepared directly by or by a contractor selected by the lead agency or where appropriate under §1501.6(b), a cooperating agency. It is the intent of these regulations that the contractor be chosen solely by the lead agency, or by the lead agency in cooperation with cooperating agencies, or where appropriate by a cooperating agency to avoid any conflict of interest. Contractors shall execute a disclosure statement prepared by the lead agency, or where appropriate the cooperating agency, specifying that they have no financial or other interest in the outcome of the project. If the document is prepared by contract, the responsible Federal official shall furnish guidance and participate in the preparation and*

*shall independently evaluate the statement prior to its approval and take responsibility for its scope and contents. Nothing in this section is intended to prohibit any agency from requesting any person to submit information to it or to prohibit any person from submitting information to any agency.*

Furthermore, the use of a third party contractor in preparing an EIS is specifically addressed by the CEQ in its “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations” in question #17a.<sup>117</sup> Per this CEQ direction:

*When a consulting firm has been involved in developing initial data and plans for the project, but does not have any financial or other interest in the outcome of the decision, it need not be disqualified from preparing the EIS. However, a disclosure statement in the draft EIS should clearly state the scope and extent of the firm's prior involvement to expose any potential conflicts of interest that may exist.*

Accordingly, disclosure statements were signed by all entities that make up the third party consulting team. These disclosure statements are included in the project record. SE Group has been involved in several other projects at A-Basin.

#### **SE Group**

Travis Beck	Director of Environmental Services/Project Manager
Kelly Owens	Assistant Project Manager
Caroline McHugh	Environmental Analyst/GIS Manager
Jonathan Jansen	Environmental Analyst
Scott Prior	Environmental Analyst
Paula Samuelson	Document Production Specialist

#### **Metcalf Archaeological Consultants, Inc.**

Kimberly Kintz	Principal Investigator
----------------	------------------------

#### **Western Ecosystems, Inc.**

Rick Thompson	Wildlife Biologist
---------------	--------------------

#### **Resource Engineering, Inc.**

Raul Passerini, P.E.	Water Resources Engineer
----------------------	--------------------------

---

<sup>117</sup> Council on Environmental Quality, 1981

**Western Ecological Resource, Inc.**

David Buscher	Soil Scientist/Ecologist
Rea Orthner	Ecologist
Lex Ivey	GIS Specialist

**B. AGENCIES, ORGANIZATIONS, TRIBAL GOVERNMENTS, AND PERSONS CONTACTED**

**FEDERAL GOVERNMENT**

U.S. Fish and Wildlife Service  
U.S. Army Corps of Engineers  
Advisory Council on Historic Preservation  
Environmental Protection Agency

**TRIBAL GOVERNMENT**

Ute Indian Tribe  
Ute Mountain Ute Tribe

**STATE GOVERNMENT**

Colorado Department of Transportation  
State Historic Preservation Office  
Colorado Department of Natural Resources  
Colorado Division of Water Resources  
Colorado Parks and Wildlife

**LOCAL GOVERNMENT**

Summit County  
Summit Water Quality Committee

**LOCAL MEDIA**

Denver Post  
Summit Daily News

## **OTHER ORGANIZATIONS**

Colorado Ski Country USA, Inc.

Keystone Citizens League

Colorado Mountain Club

Rocky Mountain Recreation Initiative

Rocky Mountain Wild

Wilderness Workshop

## **INDIVIDUALS WHO COMMENTED DURING SCOPING OR WHO HAVE PARTICIPATED IN THE NEPA PROCESS**

Matt Grigaitis

Garrett Fisher

Gary Hudiburgh

Terry Kryshak

Joel Meier

Rick Wetzel

Jeff Zimmerman

Rocky Smith

# Chapter 5

## References

---

## 5. REFERENCES

- 16 USC 497. 1999. 64 FR 8681-8690. National Forest Ski Area Permit Act of 1986 – as adopted in 1999. February 22.
- 16 USC 497b. 2011. Ski Area Recreational Opportunity Enhancement Act of 2011.
- 36 CFR 60.4. 2004. National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 *et seq.*, and EO 11593.
- 40 CFR 1500-1508.28. 1978. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, as amended July 1, 1986.
- 42 USC 7470-7479. Public Health and Welfare.
- Alexander, S., N. Waters, and P. Paquet. 2005. Traffic volume and highway permeability for a mammalian community in the Canadian Rocky Mountains. *The Canadian Geographer*. Vol 49, No. 4: 321–331.
- Andrews, J. 2015. Personal communications with Summit Stage’s transit manager. October 12.
- Arapahoe Basin Ski Area. 2013. Master Development Plan.
- Armstrong, D.M. 1972. Distribution of mammals in Colorado. University of Kansas Museum of Natural History. Mono. 3. 415 pp.
- Atkins, Dale. 2015. Personal communication with Colorado Avalanche Information Center.
- Broderdorp, K. 2003. Problems with information being provided in Biological Assessments. USFWS, Grand Jct., CO. 3 pp.
- Brosius, C. 2015. Summit Stage Survey Results. 56 pp.
- Council on Environmental Quality (CEQ). 1981. Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulation. <http://energy.gov/sites/prod/files/G-CEQ-40Questions.pdf>.
- . 1997. Environmental Justice: Guidance under the National Environmental Policy Act. Council on Environmental Quality, Executive Office of the President. Wash., D.C. 40 pp. <http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf>.
- . 2014. Draft Guidance for GHG and Climate Change for Federal Agencies. Washington, D.C. December 18.
- Colorado Department of Local Affairs – State Demography Office. 2014. Population and Household Estimates for Colorado Counties and Municipalities. Denver, CO. <https://drive.google.com/file/d/0B-vz6H4k4SESckk0SIVZMEs3ekE/view>. Accessed September 24, 2015.
- Colorado Department of Public Health and Environment – Water Quality Control Division – Stormwater Program. 2011. Stormwater Management Plan Preparation Guidance. Denver, CO. <https://www.colorado.gov/cdphe>

- Franzuebbers, A.J. 2002. Water Infiltration and Soil Structure related to organic matter and its stratification with depth. *Soil & Tillage Research* 66 (2002): 197–205.
- Henceroth, A. 2015a. Personal communication with Arapahoe Basin COO. October 6, 2015.
- . 2015b. Personal communication with Arapahoe Basin COO. September 24, 2015.
- Mailman, L. 2015. Personal communication with Community and Family Support Specialist regarding the availability of childcare services in Summit County. November 17, 2015.
- McCormick, D.E., K.K. Young, and G.M. Darby. 1982. Rock Fragments and K Factor of the Universal Soil Loss Equation. *Erosion and Productivity of Soils Containing Rock Fragments*. Madison, WI: Soil Science Society of America, 1982. 73–81.
- Morrison, J.R., W.J. de Vergie, A.W. Alldredge, A.E. Byrne, and W.A. Andree. 1995. The effects of ski area expansion on elk. *Wildl. Soc. Bull.* 23:481-489.
- National Climatic Data Center (NCDC). 2014. Annual Precipitation Normal downloaded online from the Breckenridge Station, Elev: 9580 ft. Lat: 39.486° N Lon: 106.043° [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov).
- National Geologic Map Database, 2015. Geologic Map of Montezuma Quadrangle, Colorado [http://ngmdb.usgs.gov/Prodesc/proddesc\\_4175.htm](http://ngmdb.usgs.gov/Prodesc/proddesc_4175.htm). U.S. Department of the Interior. Accessed October 27, 2015.
- Rees Consulting. 2013. 2013 Summit County Workforce Housing Needs Assessment.
- Roberts, E. 2015. Personal Communication with WRNF Wildlife Biologist. March 11.
- Roberts, E., W. Magwire and A. Nettles. 2012. Southern Summit County lynx habitat assessment, Dillon Ranger District, White River National Forest. USDA Forest Service, Silverthorne, CO. Sep. 11.
- Ruediger, B. 2000. The relationship between rare carnivores and highways: an update for Year 2000. <http://www.fs.fed.us/r1/wildlife/igbc/Linkage/Relationships.htm>. 14pp.
- Rumrill, R. 2015. Personal communications with Community Support Manager. October 12.
- SE Group. 2015. Field Verified Vegetation Cover GIS Data.
- Summit County Rescue Group. 2015. Personal communications with Summit County Rescue Group Dispatcher. November 12.
- Tanimoto, P.D. 1998. Lynx management assessment and comment to the U.S. Fish and Wildlife Service's proposal to list lynx under the Endangered Species Act of 1973. Unpubl. Rep. Predator Project, Bozeman, Montana (as cited in USFWS 2006).
- Thompson, R.W. 2014. Environmental Baseline Skier Use of Backcountry Terrain Accessed Via Arapahoe Basin Ski Area, Dillon Ranger District, White River National Forest, Summit County, Colorado.
- USDA Forest Service. 1995. *Landscape Aesthetics: A Handbook for Scenery Management*.

- . 1999a. Final Environmental Impact Statement for the Arapahoe Basin Master Development Plan. White River National Forest, Glenwood Springs. Colorado.
- . 2001. Built Environmental Image Guide. Rocky Mountain Region.
- . 2002a. White River National Forest Land and Resource Management Plan 2002 revision. White River National Forest, Glenwood Springs. CO.
- . 2002b. Final Environmental Impact Statement, Volume 1, for the White River National Forest Land and Resource Management Plan 2002 Revision. White River National Forest, Glenwood Springs. Colorado.
- . 2006. Final Environmental Impact Statement, Arapahoe Basin 2006 Improvement Plan. White River National Forest, Glenwood Springs. Colorado.
- . 2008a. Forest Service Handbook 1909.15 – National Environmental Policy Act Handbook. July.
- . 2008b. Record of Decision, Southern Rockies Lynx Amendment Management Direction. USDA Forest Service, Rocky Mountain Reg. Denver, CO. October.
- . 2009. Climate Change Considerations in Project Level NEPA Analysis. Washington, DC.
- . 2010. Field Guide to Diseases and Insects of the Rocky Mountain Region. Rocky Mountain Region, Forest Health Protection. Rocky Mountain Research Station.
- . 2012a. Final Environmental Impact Statement for the Breckenridge Ski Resort Peak 6 Project. White River National Forest, Glenwood Springs. Colorado.
- . 2012b. Forest Service Handbook 1909.15 – National Environmental Policy Act Handbook. June 25.
- . 2015. Forest Service Manual Chapter 2670 – Threatened, Endangered and Sensitive Plants and Animals, Supplement No: 2600-2015-1, Effective Date: August 29, 2015, superseding Feb. 15, 2015 WRNF list. Rocky Mountain Region, Denver, CO
- USFWS. 1999. Final programmatic biological opinion for Bureau of Reclamation’s operations and depletions, other depletions, and funding and recovery program actions in the upper Colorado River above the confluence with the Gunnison River. Grand Junction, CO. July.
- . 2012. Biological Opinion for Breckenridge Ski Resort’s (BSR) proposed Peak 6 Improvement project. USFWS Grand Jct. CO. July 23. ES/CO: FS/WRNF/DillonRD, TAILS 06E24100-2012-F-0132, 65413-2009-B-0008, ES/GJ -6-C0-12-F -003.
- . 2013. Modified Biological Opinion for Breckenridge Ski Resort’s proposed Peak 6 Improvement project. USFWS Grand Jct. CO. ES/CO: FS/WRNF/DillonRD, TAILS 06E24100-2012-F-0132, 65413-2009-B-0008, ES/GJ -6-C0-12-F -003. Apr. 19 Ltr. from, P. Gelatt, USFWS to S. Fitzwilliams, Forest Service. 19pp.
- . 2015. Biological Opinion regarding the effects from the U.S. Forest Service Authorization for Breckenridge Ski Resort’s Multi-Season Recreation Projects. Species addressed is the Canada lynx

- (*Lynx canadensis*). USFWS, Western Colorado Office, Grand Jct. CO. Sep. ES/CO: FS/WRNG, ES/GJ -6-C0-15-F -007, TAILS 06E24100-2015-F-013.
- Vaine, S. 2015. Personal communication with Summit Community Care Clinic CEO. October 12.
- Western Ecological Resource, Inc. 2016. Wetland Specialist Report Arapahoe Basin Ski Area Projects, Dillon Ranger District, White River National Forest, Summit County, Colorado.
- Western Ecosystems, Inc. 2015. DEIS Animal Biological Assessment, Biological Evaluation, Management Indicator Species, and Migratory Bird Report for Arapahoe Basin Ski Area's Beavers Lift, Trail Development, and Summer Use Improvements Project. December.
- Western Regional Climate Center, 2015 <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co2281>. Accessed October 23, 2015.

# Chapter 6

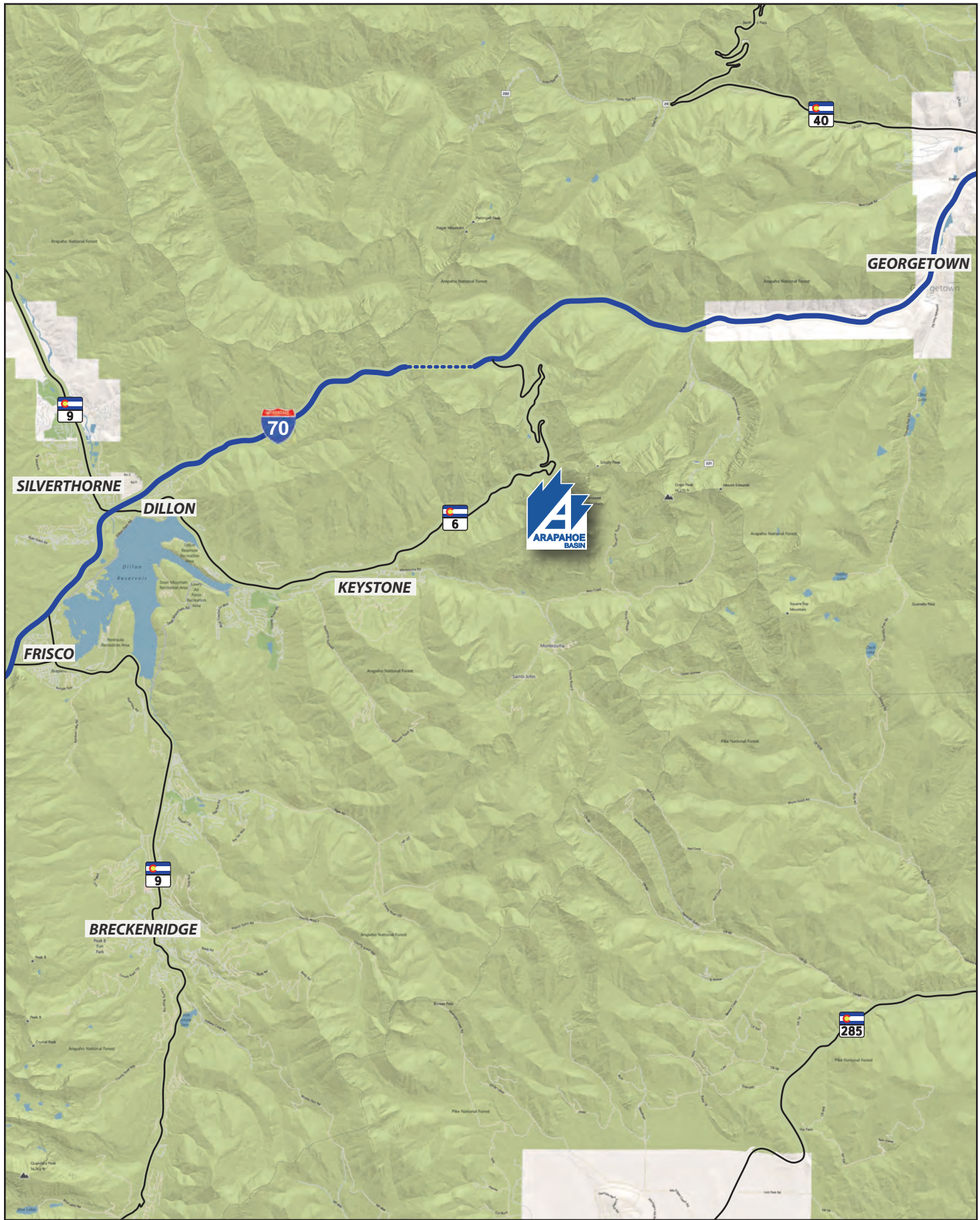
## Figures

---

## 6. FIGURES

### Vicinity Map

- Figure 1. Alternative 1 – No Action
- Figure 2. Alternative 2 – Proposed Action
- Figure 3. Alternative 1 – No Action  
*Critical Viewpoint 1: Highway 6 (Lower) – Existing Conditions*
- Figure 4. Alternative 2 – Proposed Action  
*Critical Viewpoint 1: Highway 6 (Lower) – Visual Simulation*
- Figure 5. Alternative 1 – No Action  
*Critical Viewpoint 2: Highway 6 (Upper) – Existing Conditions*
- Figure 6. Alternative 2 – Proposed Action  
*Critical Viewpoint 2: Highway 6 (Upper) – Visual Simulation*
- Figure 7. Alternative 1 – No Action  
*Critical Viewpoint 3: Upper Chisolm – Existing Conditions*
- Figure 8. Alternative 2 – Proposed Action  
*Critical Viewpoint 3: Upper Chisolm – Visual Simulation*
- Figure 9. Alternative 1 – No Action  
*Critical Viewpoint 4: Base Area – Existing Conditions*
- Figure 10. Alternative 2 – Proposed Action  
*Critical Viewpoint 4: Base Area – Visual Simulation*



NORTH



1 MILE



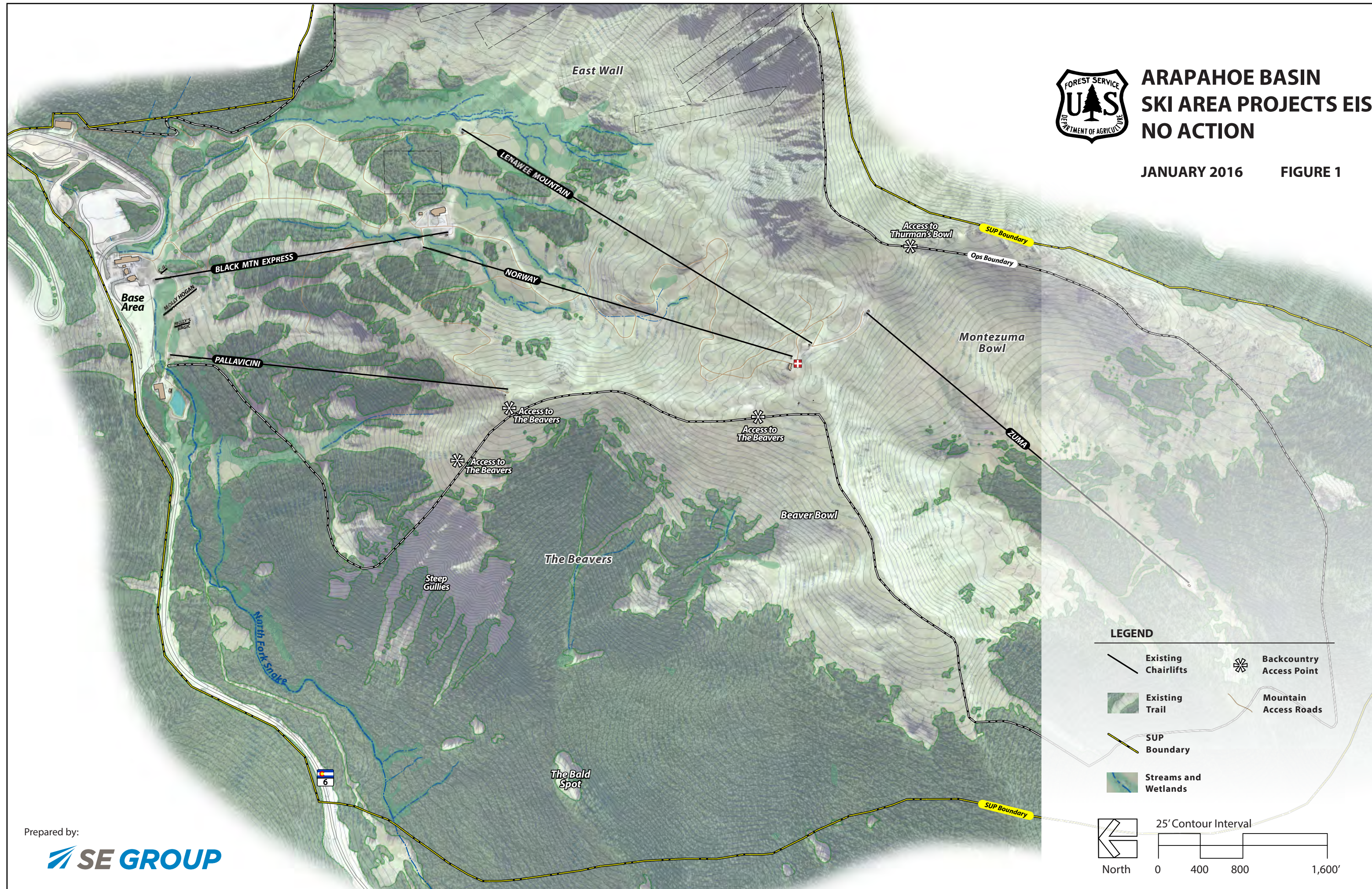
# ARAPAHOE BASIN SKI AREA PROJECTS EIS VICINITY MAP



# ARAPAHOE BASIN SKI AREA PROJECTS EIS NO ACTION

JANUARY 2016

FIGURE 1



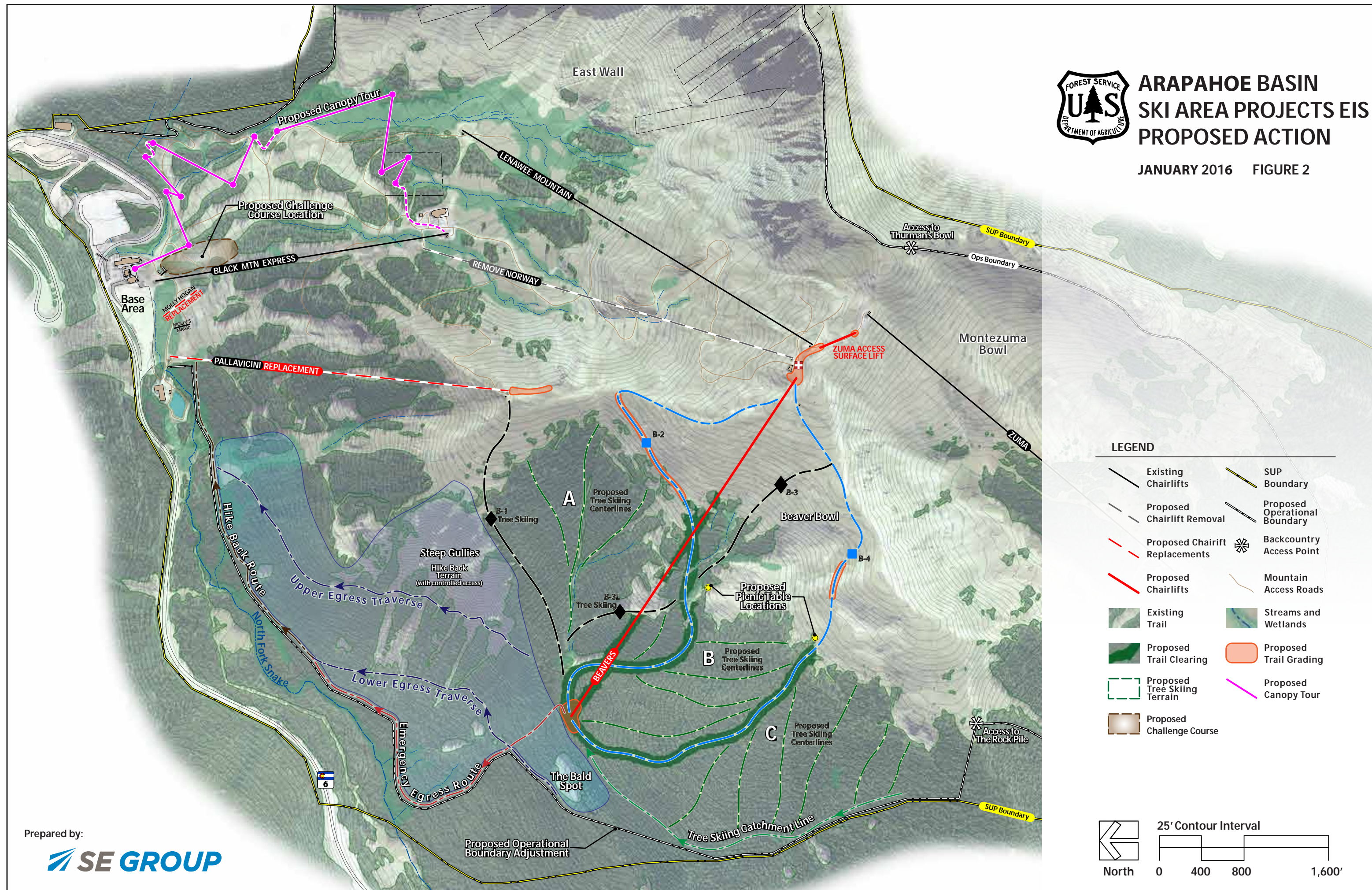
Prepared by:

**SE GROUP**



# ARAPAHOE BASIN SKI AREA PROJECTS EIS PROPOSED ACTION

JANUARY 2016 FIGURE 2



## LEGEND

- |                                 |                               |
|---------------------------------|-------------------------------|
| Existing Chairlifts             | SUP Boundary                  |
| Proposed Chairlift Removal      | Proposed Operational Boundary |
| Proposed Chairlift Replacements | Backcountry Access Point      |
| Proposed Chairlifts             | Mountain Access Roads         |
| Existing Trail                  | Streams and Wetlands          |
| Proposed Trail Clearing         | Proposed Trail Grading        |
| Proposed Tree Skiing Terrain    | Proposed Canopy Tour          |
| Proposed Challenge Course       |                               |

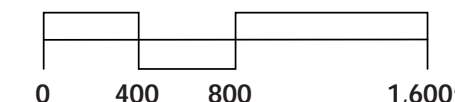
Prepared by:

**SE GROUP**



North

25' Contour Interval





# ARAPAHOE BASIN SKI AREA PROJECTS EIS NO ACTION

JANUARY 2016 FIGURE 3

## CRITICAL VIEWPOINT 1: HIGHWAY 6 (LOWER) EXISTING CONDITIONS

### Viewpoint Details

Viewpoint elevation = 10,498'

All Photographs taken by SE Group  
using a Sony SLT A55V camera  
with a 52mm focal length (35 mm equivalent)  
on 08/29/2015 from 9:30 a.m.-12:30p.m.

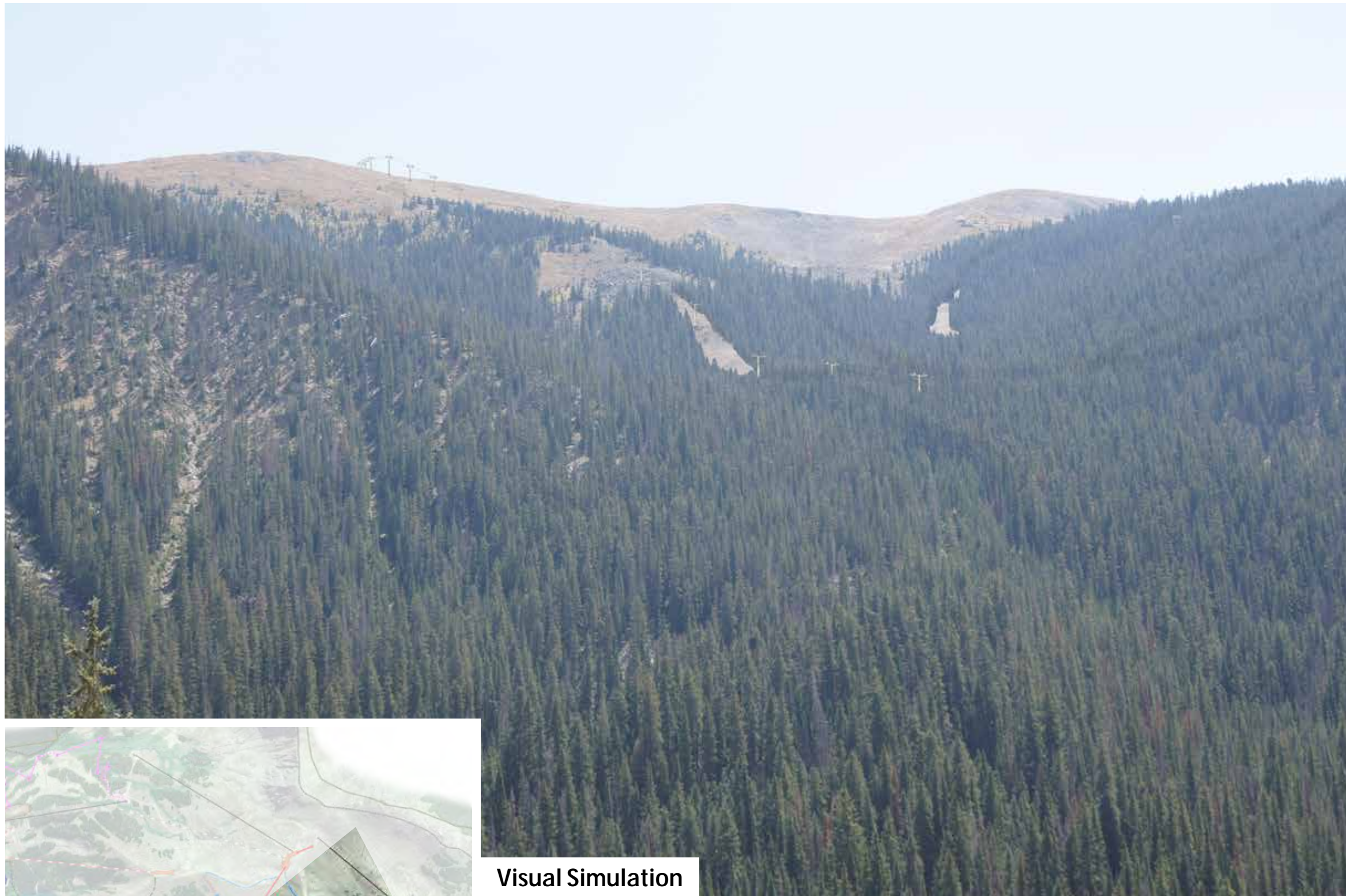


Viewpoint

Existing Conditions

Prepared by:

 **SE GROUP**



# ARAPAHOE BASIN SKI AREA PROJECTS EIS PROPOSED ACTION

JANUARY 2016 FIGURE 4

## CRITICAL VIEWPOINT 1: HIGHWAY 6 (LOWER)

### VISUAL SIMULATION

#### Viewpoint Details

*Distance to proposed bottom lift terminal = approx. 4,870'*

*Viewpoint elevation = 10,498'*

*All photographs taken by SE Group using a Sony SLT A55V camera with a 52mm focal length (35 mm equivalent) on 08/29/2015 from 9:30 a.m.-12:30 p.m*



Viewpoint

Visual Simulation

Prepared by:

**SE GROUP**



# ARAPAHOE BASIN SKI AREA PROJECTS EIS NO ACTION

JANUARY 2016 FIGURE 5

## CRITICAL VIEWPOINT 2: HIGHWAY 6 (UPPER)

EXISTING CONDITIONS

### Viewpoint Details

Viewpoint elevation = 11,153'

All photographs taken by SE Group  
using a Sony SLT A55V camera  
with a 52mm focal length (35 mm equivalent)  
on 08/29/2015 from 9:30 a.m.-12:30 p.m.

Existing Conditions

Viewpoint

Prepared by:

**SE GROUP**



# ARAPAHOE BASIN SKI AREA PROJECTS EIS PROPOSED ACTION

JANUARY 2016 FIGURE 6

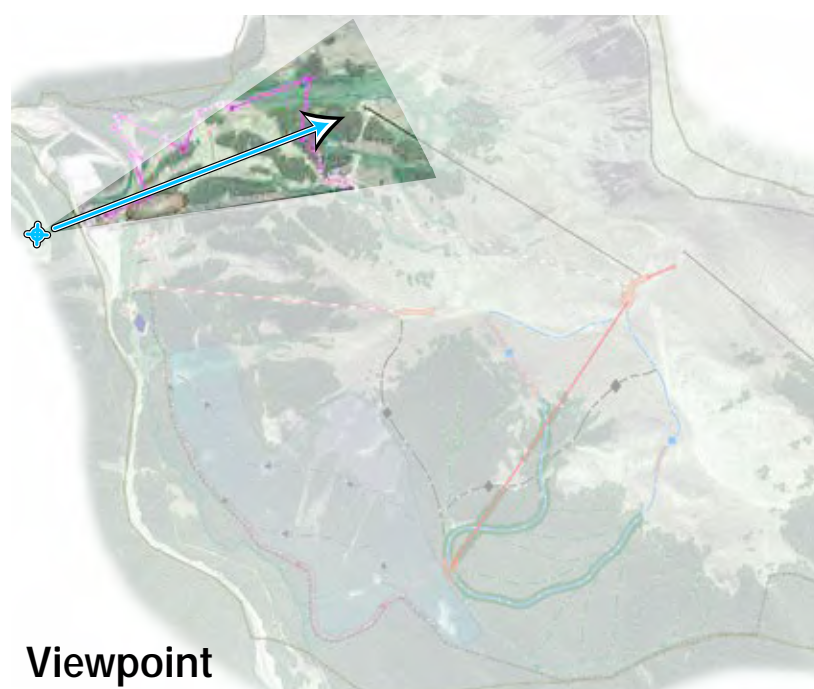
## CRITICAL VIEWPOINT 2: HIGHWAY 6 (UPPER) VISUAL SIMULATION

### Viewpoint Details

*Distance to proposed bottom canopy tour terminal = approx. 840'*

*Viewpoint elevation = 11,153'*

*All photographs taken by SE Group using a Sony SLT A55V camera with a 52mm focal length (35 mm equivalent) on 08/29/2015 from 9:30 a.m.-12:30 p.m.*

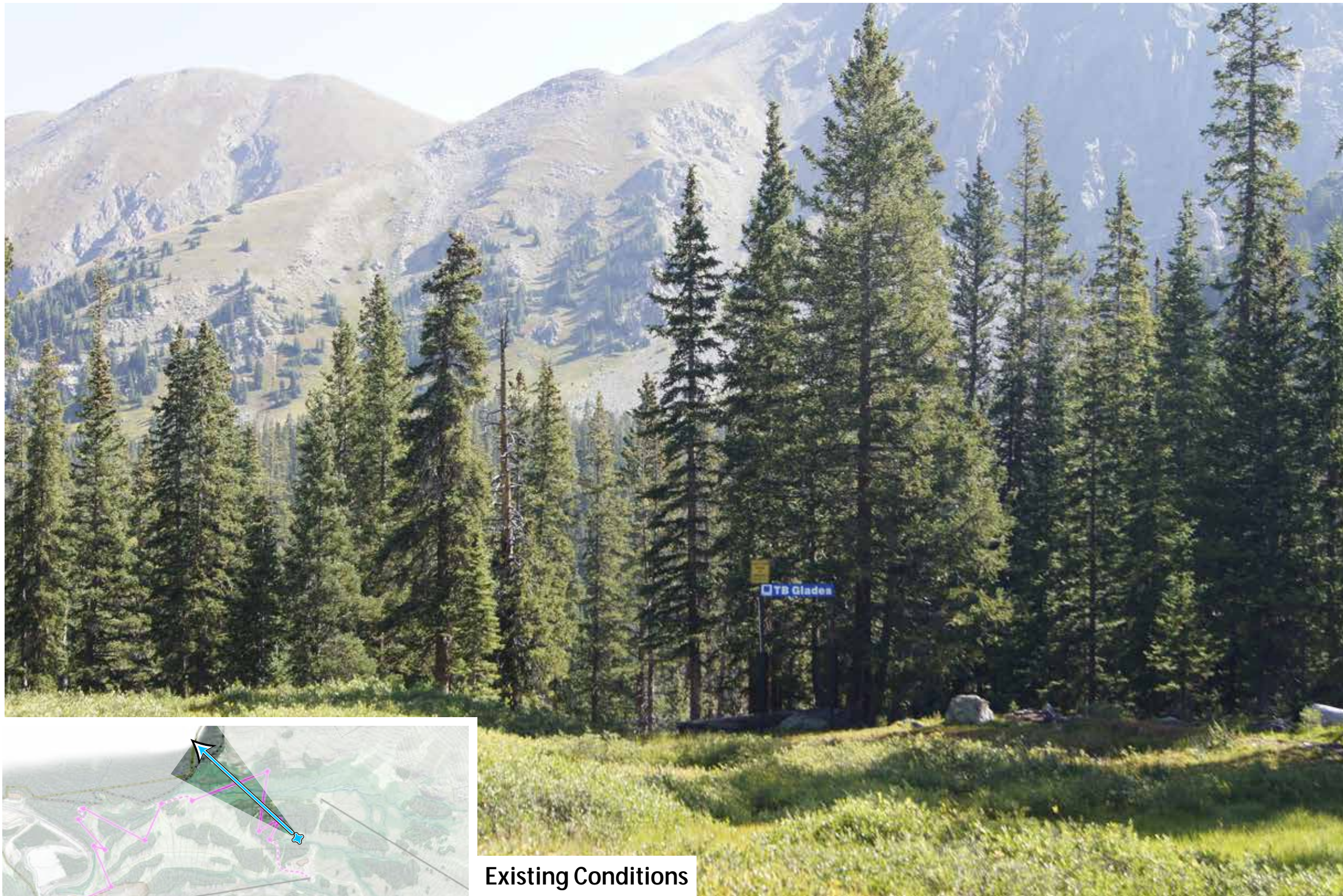


Viewpoint

Visual Simulation

Prepared by:





# ARAPAHOE BASIN SKI AREA PROJECTS EIS NO ACTION

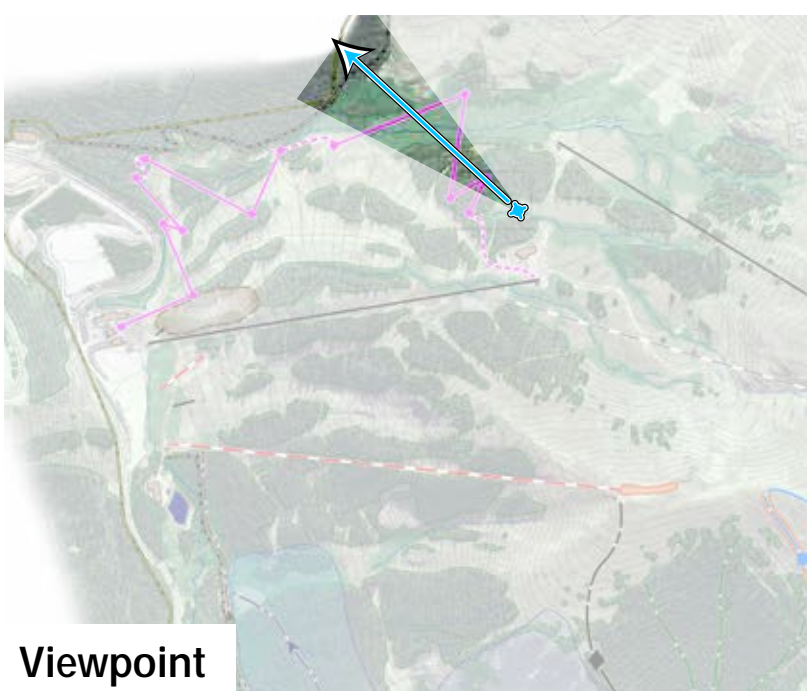
JANUARY 2016 FIGURE 7

## CRITICAL VIEWPOINT 3: UPPER CHISHOLM EXISTING CONDITIONS

### Viewpoint Details

Viewpoint elevation = 11,447'

All photographs taken by SE Group  
using a Sony SLT A55V camera  
with a 52mm focal length (35 mm equivalent)  
on 08/29/2015 from 9:30 a.m.-12:30 p.m.



Viewpoint

Existing Conditions

Prepared by:





**ARAPAHOE BASIN  
SKI AREA PROJECTS EIS  
PROPOSED ACTION**

**JANUARY 2016    FIGURE 8**

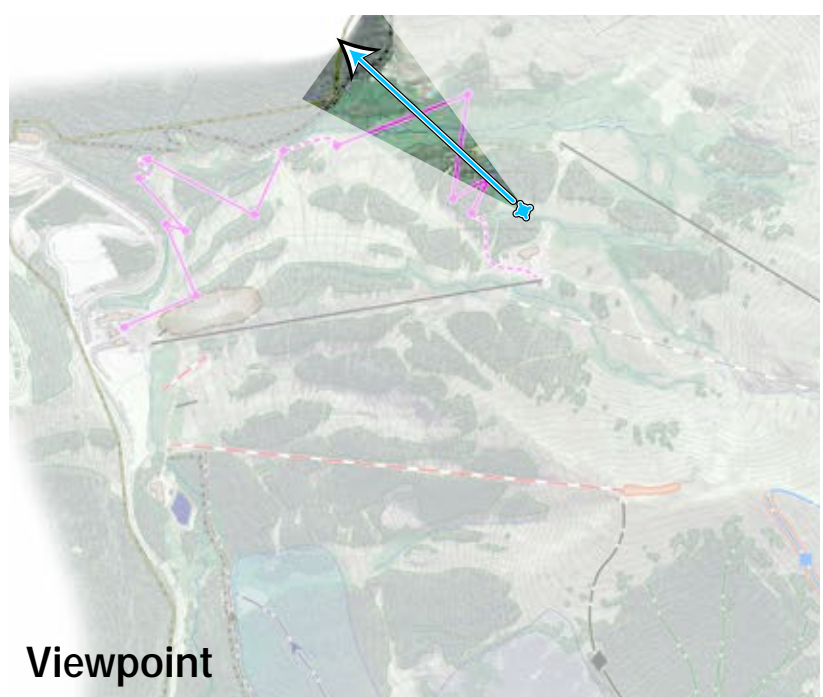
**CRITICAL VIEWPOINT 3:  
UPPER CHISHOLM  
VISUAL SIMULATION**

*Viewpoint Details*

*Distance to proposed top canopy tour terminal =  
approx. 208'*

*Viewpoint elevation = 11,447'*

*All photographs taken by SE Group  
using a Sony SLT A55V camera  
with a 52mm focal length (35 mm equivalent)  
on 08/29/2015 from 9:30 a.m.-12:30 p.m.*



**Visual Simulation**

Prepared by:





# ARAPAHOE BASIN SKI AREA PROJECTS EIS NO ACTION

JANUARY 2016 FIGURE 9

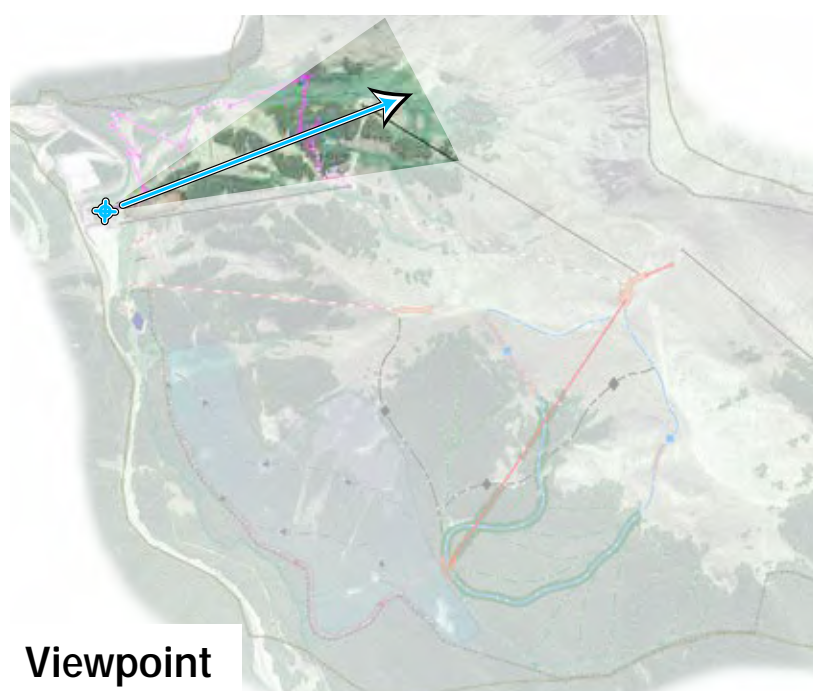
## CRITICAL VIEWPOINT 4: BASE AREA

EXISTING CONDITIONS

### Viewpoint Details

Viewpoint elevation = 10,845'

All photographs taken by SE Group  
using a Sony SLT A55V camera  
with a 52mm focal length (35 mm equivalent)  
on 08/29/2015 from 9:30 a.m.-12:30 p.m.



Viewpoint

Existing Conditions

Prepared by:

**SE GROUP**



# ARAPAHOE BASIN SKI AREA PROJECTS EIS PROPOSED ACTION

JANUARY 2016 FIGURE 10

## CRITICAL VIEWPOINT 4: BASE AREA

VISUAL SIMULATION

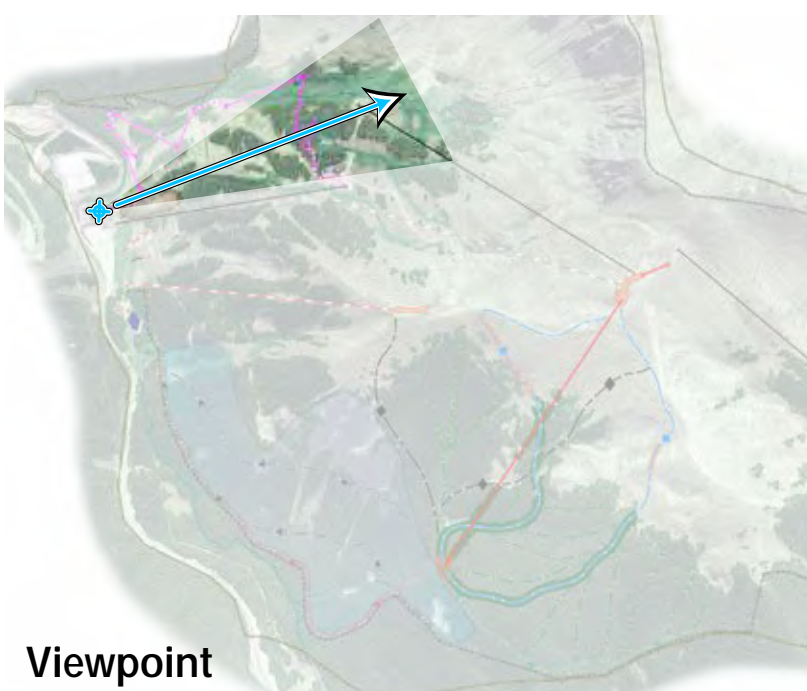
### Viewpoint Details

*Distance to proposed bottom canopy tour terminal = approx. 85'*

*Distance to proposed bottom of challenge course = approx. 200'*

*Viewpoint elevation = 10,845'*

*All photographs taken by SE Group  
using a Sony SLT A55V camera  
with a 52mm focal length (35 mm equivalent)  
on 08/29/2015 from 9:30 a.m.-12:30 p.m.*



Viewpoint

Visual Simulation

Prepared by:



# Chapter 7

## Glossary

---

## 7. GLOSSARY

**Ability Level:** The relative rank of a skier or snowboarder, or the relative rank given to alpine terrain. The six ability levels are as follows: beginner, novice, low-intermediate, intermediate, advanced-intermediate, and expert.

**Acre foot:** The amount of water necessary to cover 1 acre to a depth of 1 foot; equals 43,560 cubic feet or 325,851 gallons.

**Action Alternative:** Any alternative that includes upgrading and/or expansion of existing winter and summer recreational development within the special use permit.

**Affected environment:** The physical, biological, social, and economic environment that would or may be changed by actions proposed and the relationship of people to that environment.

**Alternative:** One of several conceptual development plans described and evaluated in the EIS.

**Annual Average Daily Traffic (AADT):** Annual average two-way daily traffic volume represents the total traffic on a section of roadway for the year, divided by 365. It includes both weekday and weekend traffic volumes.

**Artifact:** A simple object (such as a tool or ornament) showing early human workmanship or modifications.

**Analysis Area:** The geographical area and/or physical, biological, and social environments which are analyzed for specific resources in the EIS.

**Avalauncher:** A snow safety tool used to trigger controlled avalanches.

**Average Daily Traffic (ADT):** Average daily two-way traffic volume represents the total traffic on a section of roadway for a given day or sampling period, but not necessarily for a given year. It is equivalent to VPD, defined below.

**Backcountry access point:** Signed locations along the ski area operational boundary where it is permitted to leave the maintained terrain of the resort to enter unmaintained terrain outside the operational boundary.

**Backcountry terrain:** All terrain that is beyond the ski area operational boundary (defined below). Within this DEIS, backcountry terrain is described both within and beyond the ski area special use permit boundary (defined below). Backcountry terrain offers an undeveloped, unmaintained experience with the feeling of solitude.

**Background:** A landscape viewing area visible to a viewer from approximately 3 to 5 miles to infinity. Also, in economics, naturally occurring; uninduced.

**Baseline condition:** The existing dynamic conditions prior to development, against which potential effects are judged.

**Best Management Practices (BMPs):** Methods, measures, and practices specifically adopted for local conditions that minimize or avoid impacts to resources. BMPs include, but are not limited to, construction practices, structural and nonstructural controls, operations protocol, and maintenance procedures.

**Biological Evaluation:** An evaluation conducted to determine whether a proposed action is likely to affect any species which are listed as sensitive, candidate, or other special designations.

**Canopy:** The more-or-less continuous cover of leaves, needles and/or branches collectively formed by the crowns of adjacent trees in a stand or forest.

**Colorado Department of Public Health and Environment (CDPHE):** The State of Colorado Department responsible for overseeing water quality regulation within Colorado.

**Clean Water Act:** An act that was enacted by the U.S. Congress in 1977 to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. This act was formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344).

**Comfortable Carrying Capacity (CCC):** Comfortable Carrying Capacity is a planning tool used to determine the optimum level of utilization that facilitates a pleasant recreational experience. This is a planning figure only and does not represent a regulatory cap on visitation. CCC is used to ensure that different aspects of a resort's facilities are designed to work in harmony, that capacities are equivalent across facilities, and sufficient to meet anticipated demand. CCC is based on factors such as vertical transport and trail capacities.

**Council on Environmental Quality (CEQ):** An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

**Cover:** Vegetation used by wildlife for protection from predators and weather conditions, or in which to reproduce.

**Cubic feet per second (cfs):** Unit measure of streamflow or discharge, equivalent to 449 gallons per minute or about 2 acre feet per day.

**Cultural resource:** Cultural resources are the tangible and intangible aspects of cultural systems, living and dead, that are valued by a given culture or contain information about the culture. Cultural resources

include, but are not limited to sites, structures, buildings, districts, and objects associated with or representative of people, cultures, and human activities and events.

**Cumulative impact:** The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonable foreseeable future actions regardless of what agency or person undertakes such other actions. Each increment from each project may not be noticeable but cumulative impacts may be noticeable when all increments are considered together.

**Day-Skier:** Visitors that arrive in the morning to ski and drive back home at the end of the day (as opposed to a Destination Visitor”).

**Destination visitor:** A visitor that stays overnight within the resort community (as opposed to a Day-Skier”).

**Developed recreation site:** An area with characteristics that enable to accommodate, or be used for intense recreation. Such sites are often enhanced to augment the recreational value. Improvements range from those designed to provide great comfort and convenience to the user to rudimentary improvements in isolated areas.

**Developed terrain network:** consists of its named, defined, lift-served, maintained (groomed) ski trails. These trails represent the baseline of the terrain at any resort, as they are where the majority of guests ski, and are usually the only place to ski during the early season, periods of poor or undesirable snow conditions, avalanche closures, and certain weather conditions.

**Direct impact:** An effect which occurs as a result of an action associated with implementing the proposal or one of the alternatives, including construction, operation, and maintenance.

**Dispersed recreation:** Recreation that occurs outside of a developed recreation site and includes such activities as scenic driving, hunting, backpacking, and recreation activities in primitive environments.

**Distance zone:** One of three categories used in the visual management system to divide a view into near and far components. The three categories are (1) foreground, (2) middleground, and (3) background. See individual entries.

**District Ranger:** The official responsible for administering the NFS lands on a Forest Service District.

**Diversity:** The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

**Ecosystem:** The system formed by the interaction of a group of organisms and their environment, for example, marsh, watershed, or lake.

**Effects:** Results expected to be achieved from implementation of the alternatives relative to physical, biological, economic, and social factors. Effects can be direct, indirect, or cumulative and may be either beneficial or detrimental.

**Endangered species:** An official designation for any species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. An endangered species must be designated in the Federal Register by the appropriate Federal Agency Secretary.

**Environmental analysis:** An analysis of alternative actions and their predictable short- and long-term environmental effects, which include physical, biological, economic, social and environmental design factors and their interactions.

**Environmental Impact Statement (EIS):** A disclosure document required by the National Environmental Policy Act (NEPA) that documents the anticipated environmental effects of a proposed action that may significantly affect the quality of the human environment.

**Environmental Protection Agency (EPA):** The federal agency charged with lead enforcement of multiple environmental laws, including review of Environmental Impact Statements.

**Erosion:** The detachment and movement of soil from the land surface by wind, water, ice, or gravity.

**Erosion control:** Materials, structure, and techniques designed to reduce erosion. Erosion control may include rapid revegetation, avoiding steep or highly erosive sites, and installation of cross-slope drainage structures.

**Erosion hazard:** Soil ratings to predict the erosion hazard or potential to be eroded.

**Fall-line:** The fall-line is defined as the path an object would naturally take as it descends a slope under the influence of gravity. Fall-line paths indicate the natural flow of potential trails, from the top of ridges to the elevations below. Fall-line terrain allows skiers and snowboarders to make equally weighted, left and right turns.

**Forage:** All browse and non-woody plants used for grazing or harvested for feeding livestock or game animals.

**Forb:** Any non-grass-like plant having little or no woody material on it. A palatable, broadleaved, flowering herb whose stem, above ground, does not become woody and persistent.

**Foreground:** The landscape area visible to an observer from the immediate area to 0.5 mile.

**Forest Service:** The agency of the United States Department of Agriculture responsible for managing National Forests and Grasslands.

**Forest Supervisor:** The official responsible for administering the NFS lands in a Forest Service administrative unit who reports to the Regional Forester.

**Forest Plan:** A comprehensive management plan prepared under the National Forest Management Act of 1976 that provides standards and guidelines for management activities specific to each National Forest. The WRNF Forest Plan was approved in 2002.

**GIS:** Geographic information system, a computer mapping system composed of hardware and software.

**Glades:** Trees stands that are naturally thin, or have been thinned specifically in varying degrees to improve the skiing experience by increasing the spacing between individual trees.

**GPS:** Global Positioning System, a satellite-based surveying system.

**Gradient:** The vertical distance divided by the horizontal distance, usually measured as percent. Gradient is used to describe streams and ski slopes.

**Grading:** the practice of moving or re-contouring earthen materials to achieve a specified slope in the landform.

**Grooming:** The preparation and smoothing of the developed trail network's snow surface, using large over-the-snow vehicles (commonly referred to as "snow cats" or "groomers"). Groomers are equipped with front-mounted blades to push snow and rear-mounted implements to flatten and/or till the snow to the desired consistency.

**Groundwater:** Subsurface water in the part of the ground that is wholly saturated.

**Guest services facilities or guest services:** Facilities or services that are supplied by a resort – both on-mountain and at the base area – to accommodate guests' needs and to enhance the quality of the recreational experience. Examples of guest services facilities include: restaurants, warming huts, general information desks, resort lost and found departments, restrooms and lounges, ski school, daycare, public lockers and ski-check facilities, ski patrol, first aid clinics, etc.

**Guideline:** Is a preferred course of action designed by policy to achieve a goal, respond to variable site conditions, or respond to an overall condition.

**Habitat:** The sum of environmental conditions of a specific place that is occupied by an organism, a population, or a community.

**Habitat type:** A classification of the vegetation resource based on dominant growth forms. The forested areas are more specifically classified by the dominant tree species.

**Hydric soils:** Soils characterized by, or requiring an abundance of moisture, used in the identification of wetlands.

**Impacts:** See effects.

**Indicator species:** An animal species used to represent a group of species that utilize the same habitat. For monitoring purposes, the well-being of the indicator species is assumed to reflect the general health of the community.

**Indirect impact:** Secondary consequences to the environment resulting from a direct impact. An example of an indirect impact is the deposition of sediment in a wetland resulting from surface disturbance in the upland.

**Instream flow:** The volume of surface water in a stream system passing a given point at a given time.

**Interdisciplinary Team (ID Team):** A group of individuals each representing specialty resource areas assembled to solve a problem or perform a task through frequent interaction so that different disciplines can combine to provide new solutions.

**K-factor:** A measure of soil erodibility based on soil texture, organic matter, structure and runoff potential.

**Lift-line wait times:** Time spent in lift lines throughout the course of the season.

**Management Area 8.25:** According to the 2002 Forest Plan, is administered for “winter sports activities and other intensively managed outdoor recreation opportunities for large numbers of national and international visitors in highly developed settings.”

**Management direction:** A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them.

**Management emphasis:** Long-term management direction for a specific area or type of land.

**Management indicator species (MIS):** A representative group of species that are dependent of a specific habitat type. The health of an indicator species is used to gauge function of the habitat on which it depends.

**Management practice:** A specific activity, measure, course of action, or treatment.

**Master Development Plan (MDP):** A document that is required as a condition of the ski area term special use permit, designed to guide resort planning and development in the long- and short-term – typically across both public and private lands.

**Middleground:** The landscape area visible to a viewer from 0.5 mile to about 3 to 5 miles.

**Mitigation:** Actions taken to avoid, minimize, or compensate for adverse environmental impacts.

**Mountain Roads:** On-mountain primary and secondary roads that provide summertime access to mountain buildings and lift terminal locations.

**National Environmental Policy Act (NEPA):** A law enacted by Congress in 1969 that requires federal agencies to analyze the environmental effects of all major federal activities that may have a significant impact on the quality of the human environment.

**National Forest Management Act (NFMA):** A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of regulations to guide that development.

**National Forest System (NFS) lands:** National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

**National Historic Preservation Act (NHPA):** An act that was enacted by the U.S. Congress in 1966 to protect historic sites and artifacts (16 U.S.C. 470). Section 106 of the Act requires consultation with members and representatives of Indian tribes.

**National Register of Historic Places:** A listing maintained by the National Park Service of areas which have been designated as historically significant. The register includes places of local and state significance, as well as those of value to the nation in general.

**No Action Alternative:** The management direction, activities, outputs, and effects that are likely to exist in the future if the current trends and management would continue unchanged. Under NEPA, it means following the current approved Forest Plan management direction and guidance.

**Objective:** A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

**Preferred alternative:** The alternative selected from the range of alternatives which is favored by the lead agency.

**Project Area:** The area encompassed by the development proposal including base area and the permit area.

**Project Design Criteria (PDC):** Specific measures designed to minimize or avoid impacts anticipated to occur as a result of implementation of the action alternatives. PDC are incorporated within the proposal of specified action alternatives.

**Record of Decision (ROD):** A document prepared within 30 days after the final EIS is issued which states the agency's decision and why one alternative was favored over another, what factors entered into the agency's decision, and whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why not.

**Revegetation:** The re-establishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as seedbed preparation, reseeding, and mulching.

**Revegetation potential:** The ability or capacity of a site to be revegetated after a disturbance, which often depends on the quantity and quality of topsoil remaining in place.

**Rilling:** Erosion by concentrated overland flow.

**Riparian habitat or area:** Land situated along the bank of a stream or other body of water and directly influenced by the presence of water (e.g., streamsides, lake shores, etc.).

**Scenic Integrity:** State of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation for the existing landscape character in a national forest.

**Scenic Integrity Objectives (SIOs):** The objectives that define the minimum level to which landscapes are to be managed from an aesthetics standpoint. There are five objectives that describe the landscape in varying degrees from naturalness: Very High (Unaltered), High (Appears Unaltered), Moderate (Slightly Altered), Low (Moderately Altered), Very Low (Heavily Altered).

**Scenery management:** The art and science of arranging, planning and designing landscape attributes relative to the appearance of places and expanses in outdoor settings.

**Scoping process:** A process that determines the issues, concerns, and opportunities which should be considered in analyzing the impacts of a proposal by receiving input from the public and affected agencies. The depths of analysis for these issues identified are determined during scoping.

**Sediment:** Solid material, both organic and mineral, that has been transported from its site of origin by air, water, or ice.

**Sensitive species:** Species which have appeared in the Federal Register as proposed additions to the endangered or threatened species list; those which are on an official State list or are recognized by the Regional Forester to need special management in order to prevent them from becoming endangered or threatened.

**Short-term:** In this analysis, short-term describes the period from construction up to five years after project completion.

**Significant impact:** A somewhat subjective judgement based on the context and intensity of the impact. Generally, a significant impact is one that exceeds a standard, guideline, law, or regulation.

**Ski area operational boundary:** Within the SUP boundary, the boundary which defines the current extent to which ski patrol conducts snow safety activities and maintains a presence. The ski area operational boundary includes developed (i.e., maintained) and undeveloped (i.e., hike-to and off-piste) terrain.

**Skier:** At ski areas, one may see people using Alpine, snowboard, telemark, cross-country, and other specialized ski equipment, such as that used by disabled or other skiers. Accordingly, the terms “ski, skier, and skiing” in this document encompass all lift-served sliding sports typically associated with a winter sports resort.

**Skier circulation:** How guests navigate throughout a ski area; specifically, how a guest would migrate from one side of the ski area to the other and potentially back again.

**Skier visit:** One skier utilizing the ski area for any length of time; a skier visit is typically recorded as a ticket scan. Regardless of how many times a single ticket is scanned, it counts as one skier visit.

**Soil:** A dynamic natural body on the surface of the earth in which plants grow, composed of mineral and organic materials and living forms.

**Soil productivity:** The capacity of a soil for producing plant biomass under a specific system of management. It is expressed in terms of volume or weight/unit area/year.

**Special Use Permit (SUP):** A legal document, similar to a lease, issued by the U.S. Forest Service. These permits are issued to private individuals or corporations to conduct commercial operations on National Forest System lands. They specify the terms and conditions under which the permitted activity may be conducted.

**Special-use permit area:** That area of National Forest lands encompassed within the permit boundary held by A-Basin and designated for recreational use (e.g., downhill skiing and Nordic skiing). Excludes private land.

**Special-use permit boundary:** The extent of the special use permit area, within which A-Basin is permitted to provide operational facilities and guest services.

**Stand:** A community of trees or other vegetation, which is sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and to thus, form a management entity.

**Standard:** a course of action which must be followed; adherence is mandatory.

**Threatened species:** Any species which is likely to become an endangered species within the foreseeable future and which has been designated in the Federal Register as a threatened species.

**Understory:** Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory.

**U.S. Fish and Wildlife Service (USFWS):** The agency of the Department of the Interior responsible for managing wildlife, including non-ocean going species protected by the Endangered Species Act.

**Vehicles Per Day (VPD):** The total two-way daily traffic volume on a section of roadway.

**Vehicle Trips:** The number of times vehicles use a segment of road.

**Visual resource:** The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

**Water rights:** The legal right to use water.

**Watershed:** The entire area that contributes water to a drainage system or stream.

**Watershed Conservation Practices Handbook (WCPH):** A Forest Service Region 2 manual suggesting design criteria and guidelines for watershed projects.

**Water Erosion Prediction Project (WEPP):** A computer erosion model developed by the USDA Agricultural Research service (ARS) in cooperation with the Forest Service to model the physical processes involved in soil erosion mechanics, to produce erosion estimates.

**Wilderness:** Under the 1964 Wilderness Act, wilderness is undeveloped federal land retaining its primeval character and influence without permanent improvements of human habitation. It is protected and managed so to preserve its natural conditions.

**Winter range:** That part of the home range of a species where 90 percent of the individuals are located during the winter at least five out of ten winters.

**Water Influence Zone (WIZ):** The land next to water bodies where vegetation plays a major role in sustaining long-term integrity of aquatic systems. It includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge. Its minimum horizontal width (from top of each bank) is 100 feet or the mean height of mature dominant late-seral vegetation, whichever is most.

**WRENSS:** The Environmental Protection Agency's Handbook *An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources* (WRENSS).

# Chapter 8

Index

---

## 8. INDEX

### A

**A-Basin Master Development Plan (2012)**..... 1-2,  
1-3, 2-22  
**access point**..... 2-3, 2-8, 3-3, 3-7, 3-9, 3-66  
**alpine tundra**..... 3-51  
**Average Annual Daily Traffic**..... 3-24  
**Average Daily Traffic**..... 3-24

### B

**backcountry**..... 1-4, 1-5, 1-8, 2-3, 2-8, 2-26,  
2-28, 3-2, 3-3, 3-6, 3-7, 3-14, 3-15, 3-20, 3-26–3-29,  
3-36, 3-66, 3-89, 7-1  
**backcountry access point**..... 1-4, 1-5, 2-3, 2-8, 2-26,  
3-2, 3-3, 3-6, 3-66  
**Beavers Bowl**..... 3-26, 3-107, 3-120  
**Best Management Practice**..... 2-13, 2-19, 3-109, 7-2  
**Biological Assessment**..... 3-51, 3-63, 3-76, 5-1, 5-4  
**Biological Evaluation**..... 3-51, 3-63, 3-78, 5-4, 7-2  
**Built Environment Image Guide**..... 1-10, 2-13,  
2-29, 3-35, 3-45, 3-46

### C

**CDPHE**..... 3-99, 5-1, 7-2  
**Clean Water Act**..... 1-22, 2-14, 2-35, 3-99,  
3-114, 3-118, 3-121, 7-2  
**Colorado Roadless Area**..... 1-16  
**comfortable carrying capacity**..... 2-28, 3-5, 3-8,  
3-24–3-29, 7-2  
**connected disturbed area**..... 1-12, 2-19, 2-33, 2-34,  
3-103, 3-105, 3-106, 3-109  
**Council on Environmental Quality**..... 1-1, 1-14,  
1-15, 1-17, 2-1, 3-1, 4-2, 5-1, 7-2  
**critical habitat**..... 3-52, 3-53, 3-65  
**cultural resource**..... 1-10, 2-30, 3-48–3-51

### D

**diversity**..... 1-16, 2-13, 3-11, 3-17, 3-31, 3-51

### E

**East Wall of Lenawee Mountain**..... 1-2, 2-2,  
3-5, 3-74, 3-86, 3-114–3-117  
**emergency egress**..... 2-6, 2-10, 2-14, 2-15,  
2-18, 2-24, 2-32, 2-35, 3-10, 3-76, 3-77, 3-79, 3-92,  
3-93, 3-118, 3-119  
**endangered species**..... 3-63, 3-73, 7-4, 7-10  
**Environmental Protection Agency**..... 1-15, 3-98,  
3-99, 4-3, 7-4, 7-10

**erosion**..... 1-11, 1-12, 2-16, 2-19, 2-20,  
2-32, 2-34, 3-34, 3-61, 3-63, 3-81, 3-85, 3-88, 3-89,  
3-90, 3-94–3-98, 3-102–3-104, 3-109–3-111, 3-113,  
3-116, 3-117, 7-4, 7-10

**Executive Order 11990**..... 2-35, 3-114, 3-118

### F

**fen wetlands**..... 2-15, 3-52, 3-53, 3-61, 3-115, 3-119  
**Forest Plan Amendment**..... 1-2, 2-4, 2-11, 2-12, 3-77

### G

**goshawk**..... 3-70, 3-79

### H

**Highway 6**..... 1-2, 1-9, 1-11, 2-3, 2-4, 2-11,  
2-19, 2-22, 2-24, 2-26, 2-28, 2-29, 2-31, 3-3, 3-8, 3-24–  
3-31, 3-35–3-38, 3-41–3-45, 3-47, 3-48, 3-74, 3-77,  
3-78, 3-105, 3-109, 3-111, 3-117  
**hike-to/hike-back terrain**..... 1-2, 2-2, 2-5, 2-6,  
2-10, 2-14, 2-15, 2-18, 2-22–2-25, 2-35, 3-4–3-6, 3-27,  
3-28, 3-77, 3-92, 3-119, 7-9  
**hydric soils**..... 3-55

### I

**indicator species**..... 7-6

### L

**Lenawee Mountain**..... 1-2, 1-3, 1-5, 2-2, 2-4,  
2-7, 2-8, 2-23, 2-26, 3-5, 3-6, 3-9, 3-36, 3-38, 3-40,  
3-44, 3-74, 3-82, 3-86, 3-98, 3-114, 3-116, 3-117  
**lynx**..... 1-11, 2-11, 2-18,  
2-21–2-24, 2-31, 3-64–3-67, 3-69, 3-75–3-78, 3-83,  
3-84, 5-2, 5-3  
**lynx analysis unit**..... 1-11, 2-11, 3-76–3-78, 3-84

### M

**Management Indicator Species**..... 1-11, 2-31,  
2-32, 3-63, 3-71, 3-73, 3-75, 3-80–3-84, 5-4, 7-6  
**Master Development Plan**..... 1-2, 1-3, 3-10,  
3-14, 3-15, 3-22, 3-23, 3-29, 3-45, 3-47, 3-48, 3-62,  
3-83, 3-95, 3-111, 3-121, 5-1, 5-3, 7-6

### N

**North Fork Snake River**..... 2-19, 2-23,  
2-32–2-34, 3-58, 3-66, 3-69, 3-74, 3-76–3-78, 3-84,  
3-86, 3-96, 3-98–3-100, 3-105, 3-106, 3-109–3-112,  
3-114–3-117, 3-119

## P

**particulates** ..... 1-13  
**prehistoric** ..... 2-13, 2-30, 3-49, 3-50  
**Project Area** ..... 1-1, 1-2, 1-7, 1-15,  
 2-9, 2-11, 2-13–2-15, 2-18, 2-21, 2-31, 2-36, 3-1, 3-30,  
 3-31, 3-32, 3-36, 3-38–3-40, 3-47, 3-51, 3-53, 3-58,  
 3-64, 3-66, 3-67, 3-69, 3-73–3-75, 3-81, 3-82, 3-98, 7-7  
**Project Design Criteria** ..... 1-1, 1-8, 1-13,  
 1-21, 2-1, 2-12, 2-13, 2-31–2-35, 3-42, 3-50, 3-60–3-62,  
 3-79, 3-81, 3-90, 3-91, 3-94–3-96, 3-103–3-105, 3-109,  
 3-110, 3-112, 3-113, 3-118, 3-119, 3-120, 7-7  
**proposed species** ..... 3-63

## R

**riparian habitat** ..... 3-113, 3-117

## S

**Scenic Integrity Objectives** ..... 1-9, 2-29, 3-32,  
 3-33, 3-41, 3-42, 3-44–3-47, 7-8  
**sediment** ..... 1-12, 2-15, 2-16,  
 2-17, 2-19, 2-20, 2-33, 2-36, 3-85, 3-97, 3-101–3-106,  
 3-109–3-111, 3-113, 3-116, 3-118, 7-6  
**sensitive species** ..... 2-14, 2-18, 3-51,  
 3-57, 3-58, 3-63, 3-73, 3-75, 3-78, 3-84  
**Ski Area Recreational Opportunity Enhancement  
 Act of 2011** ..... 1-6, 1-19, 1-20, 3-34, 5-1  
**Special Use Permit** ..... 1-2, 1-4–1-6,  
 1-8–1-12, 1-15, 1-16, 1-18, 1-22, 2-3, 2-6, 2-8, 2-12,  
 2-14, 2-25, 2-26, 2-29, 2-31–2-33, 7-9  
**social services** ..... 3-18, 3-21  
**Special Use Permit** ..... 3-2, 3-5, 3-7, 3-10,  
 3-11, 3-13–3-15, 3-23, 3-29, 3-30, 3-32, 3-35, 3-36,  
 3-39, 3-41–3-52, 3-62, 3-63, 3-66, 3-69, 3-74, 3-78,  
 3-82, 3-84, 3-86, 3-87, 3-89, 3-94–3-96, 3-98, 3-111,  
 3-113, 3-116, 3-117  
**Species of Local Concern** ..... 1-10, 2-14,  
 2-30, 3-51, 3-57–3-59, 3-61, 3-73, 3-75, 3-82  
**Species with an Identified Viability Concern** ..... 1-10,  
 2-14, 2-30, 3-51, 3-57, 3-58  
**Spruce Beetle** ..... 3-58, 3-59, 3-62  
**standards and guidelines** ..... 1-9, 1-18, 2-12,  
 2-29, 3-33, 3-48, 3-121, 7-5, 7-6  
**Steep Gullies** ..... 1-4, 2-3, 2-5, 2-6,  
 2-8, 2-18, 2-22–2-26, 2-28, 2-31, 2-33, 3-2–3-4, 3-7–  
 3-9, 3-26, 3-37, 3-43, 3-66, 3-77, 3-90, 3-92, 3-99,  
 3-107, 3-113, 3-118, 3-120  
**stream health** ..... 1-12, 2-19, 2-33, 2-34,  
 3-81, 3-85, 3-96–3-98, 3-101–3-106, 3-109, 3-111,  
 3-112, 3-113

**survey** ..... 2-14, 3-19, 3-53, 3-60, 3-61, 3-100,  
 3-104, 3-105

## T

**The Beavers** ..... 1-3, 1-4, 1-6–1-11, 1-18, 2-1,  
 2-3–2-8, 2-10, 2-11, 2-15, 2-18, 2-21–2-31, 2-35, 3-2–  
 3-4, 3-6–3-10, 3-15, 3-20, 3-26–3-28, 3-30, 3-36, 3-37,  
 3-41–3-43, 3-48, 3-51, 3-62, 3-66, 3-69, 3-75–3-78,  
 3-89, 3-92, 3-93, 3-113, 3-114, 3-117–3-119  
**The Rock Pile** ..... 2-25  
**threatened species** ..... 3-64, 7-8, 7-10  
**Threatened, Endangered, and Sensitive species** ..... 1-10,  
 1-11, 2-30, 2-31, 2-32, 3-63  
**tree skiing** ..... 1-4, 1-9, 2-5, 2-11, 2-25,  
 2-29, 2-31, 2-32, 3-7, 3-8, 3-43, 3-59, 3-62, 3-65, 3-91,  
 3-93, 3-99, 3-107, 3-118, 3-119

## U

**U.S. Army Corps of Engineers** ..... 1-22, 2-14, 2-35,  
 3-114, 3-118, 4-3  
**U.S. Fish and Wildlife Service** ..... 1-22, 3-52, 3-64,  
 3-65, 3-72, 3-73, 3-81, 4-3, 5-1–5-4, 7-10

## V

**visitation** ..... 1-9, 1-11, 2-28, 2-31, 3-10, 3-27, 3-28, 7-2  
**visual quality** ..... 2-10

## W

**Water Influence Zone** ..... 1-11, 1-12, 2-20,  
 2-32–2-34, 3-96, 3-98, 3-103, 3-104, 3-109, 3-110,  
 3-112, 3-113, 7-10  
**water yield** ..... 1-12, 2-33, 3-99, 3-100, 3-108  
**Watershed Conservation Practices** ..... 1-12, 2-34, 7-10  
**Watershed Conservation Practices Handbook** ..... 1-12,  
 2-34, 3-84, 3-85, 3-94, 3-96, 3-97, 3-101–3-105, 3-111,  
 3-113, 7-10  
**White River National Forest** ..... 1-2, 1-3, 1-4,  
 1-6, 1-7, 1-10, 1-17, 1-18, 1-21, 2-1, 2-13, 2-14, 2-16,  
 2-17, 2-18, 2-23, 2-24, 2-30, 3-2, 3-4, 3-10, 3-14, 3-15,  
 3-23, 3-32, 3-33, 3-35, 3-47, 3-48, 3-51–3-53, 3-57,  
 3-58, 3-62–3-64, 3-71, 3-78, 3-80, 3-83–3-86, 3-89,  
 3-91, 3-94, 3-104, 3-111, 3-112, 3-121, 4-1, 5-2–5-4,  
 7-5  
**wilderness** ..... 7-10

# Appendices

---

## Appendix A: Cumulative Effects Projects

---

# APPENDIX A: CUMULATIVE EFFECTS PROJECTS

**Table A-1:  
Cumulative Effects Matrix**

<b>Project</b>	<b>Project Location (Straight Line Distance to A-Basin Ski Area SUP)</b>	<b>Project Description</b>	<b>Project Approval/ Implementation</b>	<b>Project Area (acres/length)</b>	<b>Lynx Analysis Unit where the Project is Located</b>	<b>Resources Potentially Affected that Apply to this EIS</b>
<b>Ski Area Projects</b>						
<b>A-Basin MDP Update</b>	0 miles	An additional snowmaking reservoir and a zip line were accepted in the master plan but have been withheld from review in this EIS. All other updates in the MDP are included in the EIS as elements of the Proposed Action. All past projects that have been constructed are included in the Affected Environment.	Accepted: 2012	Increase operational boundary by approximately 475 acres	Snake River	Wildlife Vegetation and Botany Watershed Wetlands Soils Scenery Noise Social and Economic Resources Recreation Traffic
<b>Keystone Resort Dercum Mountain Improvements Projects EA</b>	4.6 miles	The 2014 DN approved nine miles of new mountain bike trails, a new Adventure Point facility, and various ski-related improvements	Approved: 2014	Approximately 500 acres across the SUP	Snake River	Wildlife Vegetation and Botany Watershed
<b>Keystone Resort MDP</b>	4.6 miles	The Keystone Resort MDP includes a new/upgraded lifts, trails, snowmaking, mountain bike trails and guest service facilities throughout the resort's SUP.	Accepted: 2009	8,536 acres across the SUP	Snake River	Wildlife Vegetation and Botany Watershed Wetlands Scenery Noise Social and Economic Resources Recreation Traffic

**Table A-1:  
Cumulative Effects Matrix**

<b>Project</b>	<b>Project Location (Straight Line Distance to A-Basin Ski Area SUP)</b>	<b>Project Description</b>	<b>Project Approval/ Implementation</b>	<b>Project Area (acres/length)</b>	<b>Lynx Analysis Unit where the Project is Located</b>	<b>Resources Potentially Affected that Apply to this EIS</b>
<b>Copper Mountain Resort MDP</b>	18 miles	CMR's 2011 MDP identifies various winter and year-round improvements, including new and upgraded lifts and terrain, snowmaking, additional hiking and mountain biking trails, a spring/summer superpipe, mountain coaster, zip lines, ropes course, and a bike park.	Implementation: On-going	7,686-acre SUP	Tenmile	Social and Economic Resources Recreation
<b>Breckenridge Ski Resort Summer MDP Addendum</b>	15.3 miles	BSR prepared a MDP addendum to include summer activities on NFS lands, within the SUP area.	Accepted: 2013	Areas within the developed ski area on Peaks 7 and 8	Swan River	Social and Economic Resources Recreation
<b>Breckenridge Ski Resort MDP</b>	15.3 miles	BSR prepared a MDP, which was accepted by the Forest Service in January 2008.	Accepted: 2008	Areas within the developed ski area on Peaks 7, 8, 9 and 10	Swan River	Social and Economic Resources Recreation
<b>Breckenridge Ski Resort Peak 6 EIS</b>	15.3 miles	Peak 6 development included approximately 550 acres of skiable terrain, a six-person chairlift on Peak 6 and a four-person chairlift extending onto Peak 7. Backcountry terrain on Peak 6 was eliminated and total backcountry terrain was reduced by 820 acres.	Implemented: 2013	70 acres of cleared trails within a 500- acre project area	Swan River	Recreation Social and Economic Resources

**Table A-1:  
Cumulative Effects Matrix**

<b>Project</b>	<b>Project Location (Straight Line Distance to A-Basin Ski Area SUP)</b>	<b>Project Description</b>	<b>Project Approval/ Implementation</b>	<b>Project Area (acres/length)</b>	<b>Lynx Analysis Unit where the Project is Located</b>	<b>Resources Potentially Affected that Apply to this EIS</b>
<b>Vail Mountain Recreation Enhancements Project EIS</b>	26.8 miles	The 2014 ROD approved several multi-season recreation projects, including canopy tours, a mountain coaster, hiking and mountain biking trails, and an adventure course, among others.	Implementation: On-going	16 acres; Up to 55 miles of trails	Eagle Valley and Camp Hale	Recreation
<b>Miscellaneous Backcountry Recreation Project</b>						
<b>Weber Gulch Hut EA</b>	13 miles	Construction of Weber Gulch Backcountry Hut for both winter and summer use. The hut will be one or two stories and between 1,400 and 2,000 square feet in size. It would accommodate 16 guests.	Approved: 2014	3 mile non- motorized access route, up to 2,000- square foot building	Swan River	Recreation
<b>Regional Projects</b>						
<b>Continued Build- out of Summit County</b>	Surrounding	All basins are roughly 70–85% built out. At the current growth rate there would be approximately 30,694 residential units in the county by the year 2020.	Implementation: On-going	608 square miles	Forest Wide	Wildlife Watershed Social and Economic Resources Scenery Traffic
<b>Continued Build- out of Snake River Basin</b>	Surrounding	As of July 2009 the snake river basin was at nearly 72% build-out for its residential PUD and 48% of its commercial PUD within Keystone resort. Growth has slowed in recent years but continued build out will remain a factor for the area.	Implementation: On-going	74,015 acres	Snake River	Wildlife Watershed Social and Economic Resources Scenery Traffic

**Table A-1:  
Cumulative Effects Matrix**

<b>Project</b>	<b>Project Location (Straight Line Distance to A-Basin Ski Area SUP)</b>	<b>Project Description</b>	<b>Project Approval/ Implementation</b>	<b>Project Area (acres/length)</b>	<b>Lynx Analysis Unit where the Project is Located</b>	<b>Resources Potentially Affected that Apply to this EIS</b>
<b>Residential Developments in the Lower Blue River Basin</b>	11 miles	Two major residential developments in Silverthorne are expected to add a number of single family and affordable housing units to the area. The Summit Sky Ranch development is expected to add 240 units while the Smith Ranch workforce housing development is expected to add 80-100 units in the next five years.	Implementation: On-going	Summit Sky Ranch- 416 acres Smith Ranch- 52 acres	Snake River	Wildlife Watershed Social and Economic Resources Scenery Traffic
<b>2011 Keystone Ski Area Forest Health Project</b>	4.6 miles	Implement a variety of vegetation treatments on NFS lands within the Keystone SUP area. These treatments are designed to minimize risk for users and infrastructure and to expedite forest regeneration following the ongoing mountain pine beetle epidemic. Entails removing dead and dying trees, regenerating lodgepole pine where they occur, and perpetuating mixed conifer and aspen stands throughout Keystone's SUP area.	Approved: 2011	~1,647 acres	Snake River	Wildlife Watershed Vegetation and Botany
<b>Lower Snake Wildland Urban Interface Project</b>	4.5 miles	The Dillon Ranger District proposes to implement approximately 1,250 acres of vegetation management and fuel reduction activities that reduces the extent of and increases resilience to current and potential insect and disease infestations.	Developing Proposal	~1,250 acres	Snake River	Wildlife

**Table A-1:  
Cumulative Effects Matrix**

<b>Project</b>	<b>Project Location (Straight Line Distance to A-Basin Ski Area SUP)</b>	<b>Project Description</b>	<b>Project Approval/ Implementation</b>	<b>Project Area (acres/length)</b>	<b>Lynx Analysis Unit where the Project is Located</b>	<b>Resources Potentially Affected that Apply to this EIS</b>
<b>Tenderfoot Mountain Motorcycle Trail System Project EA</b>	8 miles	The project would create an approximately 31-mile motorized trail system with 21 miles of single-track and 10 miles of existing road. Twenty-two miles of user-created, non-system trails in the area would be closed and rehabilitated. The proposed trail system would be managed for all non-motorized uses as well as for single-track motorized uses (motorcycles).	Approved: 2014	31 miles	Snake River	Wildlife
<b>Transportation</b>						
<b>I-70 Mountain Corridor PPSL</b>	11.4 miles	The project upgraded 13 miles of Eastbound I-70 by creating a Mountain Express toll lane that will only open during peak travel periods and operates as a third lane. Prices of the lane will fluctuate with traffic demands.	Implementation: On-going	13 miles of Eastbound I-70	N/A	Traffic
<b>Loveland Pass Gazex Avalanche Mitigation System</b>	0.1 to 3 miles	The project will install 4 control shelters and 11 “exploders” on the east side of Loveland Pass in the seven sisters slide zone above highway 6 in hopes of better controlling avalanches, and reducing the chance of lengthy road closure.	Approved: 2014	7.5 miles of Highway 6	Snake River	Traffic

**Table A-1:  
Cumulative Effects Matrix**

Project	Project Location (Straight Line Distance to A-Basin Ski Area SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected that Apply to this EIS
<b>Forest Service Programmatic Projects</b>						
<b>WRNF Forest Plan – 2002 Revision</b>	0.1-100 miles	The decision approved Alternative K in the Final EIS as the 2002 Revised Land and Resource Management Plan. Alternative K sustains the capabilities of forest ecosystems while addressing social values and expectations, as well as managing for multiple resource outputs. Ecosystem components are actively managed to improve wildlife habitat, water quality and soil productivity. Management activities maintain or restore ecosystem structure, function and composition. Emphasis is placed on quality recreation experiences in a predominately natural setting. Recreation growth becomes more managed, while still allowing modest increases in use.	April 2, 2002, as amended	2,270,000 acres	Forest-wide	Wildlife Watershed Vegetation and Botany Wetlands Scenery Noise Social and Economic Resources Recreation
<b>WRNF Travel Management Plan</b>	0.1–100 miles	The Forest Service has approved a comprehensive travel management plan (TMP) for the WRNF. The TMP approved ways to accommodate and balance the transportation needs of the public and provide adequate access for forest and resource management, while still allowing for protection of natural resources.	Implementation: On-going	Project area includes 2,482,000 acres within the WRNF	Forest-wide	Wildlife

## Appendix B: Forest Plan Amendment

---

## APPENDIX B: FOREST PLAN AMENDMENT

A Forest Plan Amendment may be required should Alternative 2 – Proposed Action be selected.

### FOREST SERVICE DIRECTION FOR AMENDING FOREST PLANS

The Forest Service requirements for amending forest plans are included in agency regulations and policies. These require that proposed activities be consistent with forest plans and that proposed activities which may be in conflict with the Forest Plan either be denied or modified (so as to be consistent), or that the Forest Plan be amended. The Forest Service is authorized to implement amendments to forest plans in response to changing needs and opportunities, information identified during project analysis, or the results of monitoring and evaluation. The process to consider Forest Plan Amendments is contained in 36 CFR 219.13 and FSH 1909.12, Chapter 20.

The 2002 Forest Plan states:

*Site-specific project decisions must be consistent with the plan unless it is modified by amendment. Determining whether a project is consistent with the forest plan is based on whether it follows forest wide and management area standards. Projects that do not comply with standards must be found to be inconsistent with forest plan management direction, unless standards are modified through forest plan amendment. In the latter case, project approval and forest plan amendment may be accomplished simultaneously.<sup>1</sup>*

### PROPOSED AMENDMENT TO THE WHITE RIVER NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

In October 2008 the R2 issued the SRLMD ROD.<sup>2</sup> The new management direction provides 1 goal, 13 objectives, 7 standards, and 34 guidelines. The SRLMD amended the 2002 Forest Plan:

*To establish management direction that conserves and promotes the recovery of lynx, and reduces or eliminates potential adverse effects from land management activities and practices on national forest in the Southern Rockies, while preserving the overall multiple-use direction of existing Plans.<sup>3</sup>*

The WRNF has identified aspects of Alternative 2 that would not be consistent with the WRNF Forest Plan as amended by the SRLMD.

---

<sup>1</sup> USDA Forest Service, 2002 p. P-4

<sup>2</sup> USDA Forest Service, 2008b

<sup>3</sup> Ibid.

Specifically, Alternative 2 would not be consistent with Standard ALL S1 that specifies:

*New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.*

For the following reasons, Alternative 2 may not meet the intent of the “maintain” term in this standard:

- The Proposed Action would directly affect 63.3 acres of lynx habitat, converting 32.5 of winter foraging habitat and 30.8 acres of denning habitat into 41.9 acres of other habitat and 21.4 acres of non-habitat. The permanent loss of this acreage of undeveloped and generally effective lynx habitat would result in an adverse effect to lynx.
- The additional skier use resulting from development of the Beavers would further impair already impaired habitat connectivity through undeveloped A-Basin ski terrain and through this local portion of the LAU and Loveland Pass Lynx Linkage during the ski season. This would impair the ability of lynx to hunt and forage through the active terrain during the ski season, thereby negatively affecting home range efficacy and adversely affecting daily (intra-home range) lynx movements.
- The relatively small, additional, project-related traffic going through the Loveland Pass Lynx Linkage on Highway 6 could have an adverse effect on lynx.

Ultimately, the determination of consistency with Standard ALL S1 and the need for a Forest Plan Amendment would be made in the ROD once the entire analysis is complete and public input is considered.

Appendix C:  
Forest Service Manual 2343  
Screening Report

---

# WHITE RIVER NATIONAL FOREST

## MOUNTAIN SPORTS PROGRAM

### PROJECT PLANNING

---

#### Arapahoe Basin Ski Resort – Canopy Tour/Challenge Course Proposal

January 2016

#### FSM 2343 Screening – Additional Seasonal and Year-Round Recreation at Ski Areas

##### Introduction

The following table discloses how the proposed Zip Line Canopy Tour and Ropes Challenge Course at Arapahoe Basin comply with Forest Service direction regarding the appropriateness of additional seasonal and year-round activities at ski areas permitted on National Forest System (NFS) lands.

The screening process for determining compliance with Forest Service Manual direction occurs at three separate stages of planning:

- (1) Master Development Planning – review of long-term, resort-wide plans for development.
- (2) NEPA Analysis – environmental analysis of site-specific proposed activities at the resort.
- (3) Post-Decision Engineering and Design Reviews – review of final design documents that disclose final facility layouts and architectural design details.

As project activity details develop through these progressive planning phases, additional activity information is often necessary to ensure compliance with agency direction. At this stage of the process (NEPA Analysis), the agency has received sufficient activity information (general locations, disturbance footprints, general facility design and dimensions, and activity schematics) to screen the proposed activities in accordance with FSM direction and anticipate their impacts to the environment.

A final determination for compliance will be made after the third and final review stage when the agency can fully evaluate final project details. The agency will utilize the Scenery Management System, Built Environment Image Guide, the Recreation Opportunity Spectrum, and other design and engineering reviews to ensure that additional seasonal or year-round recreation activities and associated facilities are located and constructed to harmonize with the surrounding natural environment and meet agency direction.

##### Master Development Planning

Ski area Master Development Plans (MDPs) guide the placement and design of additional seasonal or year-round recreation activities. As part of the master development planning process, the following criteria must be met:

FSM Direction	Criteria	Findings
2343.14 (8)(a)	Establish zones to guide placement and design of additional seasonal or year-round recreation facilities, basing the zones on the existing natural setting and level of development to support snow sports	The design and location of these facilities and activities are consistent with the vision, zoning and proposed uses found in the 2016 Addendum to the 2012 Master Development Plan
(8)(b)	Depict the general location of the facilities	The general location of facilities has been included in the proposal.
(8)(c)	Establish an estimated timeframe for their construction	It is assumed that the proposed projects will be implemented within 1-3 years after the decision.

### Proposed Activities and Associated Facilities

The proposed Zip Line Canopy Tour and Ropes Challenge Course are considered additional seasonal or year-round recreation activities. The following criteria must be met for these activities and their associated facilities:

FSM Direction	Criteria	Findings
2343.14 (1)(a)	Not change the primary purpose of the ski area to other than snow sports	<p>The proposed activities will individually and collectively supplement existing summer visitation and will increase visitation by a small amount when compared to winter use visits. Revenue from snow sports activities exceed and are projected to continue to exceed revenue from summer uses.</p> <p>The proposed activities will not change the primary purpose of the ski area for snow sports.</p>
(1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	<p>The canopy tour will afford visitors scenic views of the surrounding mountain landscape and vegetation. The activities encourage outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities.</p> <p>The desired experience and activity is dependent on a change in elevation (gravity-based) and engagement with a mountain forest setting. The design and location of the activities utilize the natural resource attributes of topography, mountain scenery (foreground and background views) and vegetation (layout and location within and adjacent to a forested stand) to make it sufficiently natural resource-based. The layout and location and combination of zip lines with rappels and short hikes between segments is dependent upon the natural setting and is expected to engage visitors with the high alpine environment.</p> <p>The zip lines are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity itself replicates and is rooted in traditional climbing and mountaineering practices.</p>
(1)(c)	To the extent practicable, be located within the portions of the ski area that are developed or that will be developed pursuant to the master development plan	<p>All activities and associated facilities will be located within the portions of the ski area that are planned for development in the master development plan.</p> <p>All activities would occur within the Special Use Permit boundary and the current developed winter operational boundary.</p>
(1)(d)	Not exceed the level of development for snow sports and be consistent with the zoning established in the applicable master development plan	<p>The level of development for snow sports will not be exceeded with these proposals. Summer uses would continue to be subordinate to the snow sports activities at the ski area.</p> <p>The design and location of these facilities and activities are consistent with the vision, zoning and proposed uses found in the 2016 Addendum to the 2012 Master Development Plan.</p>
(1)(e)(1)	To the extent practicable, harmonize with the natural environment of the site where they would be located by being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	<p>Based on proposed locations and activity designs, the activity will be visually consistent with and subordinate to the ski area's existing facilities, vegetation and landscape.</p> <p><b>Zip Line Design:</b> The zip line is designed to minimize and avoid tree removal, blend with the forest canopy (towers), and utilize natural materials in its construction. BEIG concepts and criteria will be incorporated into final design to ensure compliance with this criterion.</p>

		<p><b>Location and Layout:</b> The zip line is situated in and around forested locations located adjacent to and on the periphery of existing snow sports infrastructure. Tower locations are primarily adjacent to ski slopes and pods that include existing ski lifts.</p> <p><b>Height and Massing:</b> Proposed tower heights should be consistent with vegetative canopy height. Building Design Review of final structural details will further determine compliance with direction.</p> <p>The zip line operates within narrow corridors (16" and less than an average ski trail) limiting its visual footprint and requiring limited tree removal. Zip line cables will be visible as they extend far above the canopy at times but are small in diameter and would be similar to appearance as the ski lift cables nearby.</p> <p>Tower stations would have guy wire re-enforcements. These guy wires would extend into forested areas and be subordinate to surrounding vegetation. Fences (e.g. buck and rail or safety ropes) may be required to minimize wire/user conflicts.</p> <p><b><u>Ropes Challenge Course</u></b></p> <p><b>Design:</b> The course is designed to avoid tree removal, blend with the existing trees and forest canopy, and utilize natural materials in its construction. BEIG concepts and criteria will be incorporated into final design to ensure compliance with this direction.</p> <p><b>Location and Layout:</b> The courses will be situated in a discrete, forested location located adjacent to and on the periphery of existing snow sports infrastructure. Tower locations will be located entirely within or as close to tree islands as possible to ensure the course sits within tree islands instead of outside of them.</p> <p><b>Height and Massing:</b> Proposed tower heights should be consistent with vegetative canopy height. Building Design Review of final structural details will further determine compliance with direction.</p> <p>The course will operate within a forested location requiring limited to no tree removal. Course height should be similar to the surrounding canopy when viewed from the parking lot and base area. The course structures are elongated across the project area with multiple stations and towers to avoid a multi-story, box like structure. This better aligns with the natural topography of the area and better blends with the existing vegetation and landscape.</p>
(1)(e)(2)	To the extent practicable, harmonize with the natural environment of the site where they would be located by not requiring significant modifications to topography to facilitate construction or operations	Little modification to topography would be required to construct and operate the zip line and ropes challenge course. Tower footings and support structures have minimal footprints to reduce soils disturbance.
(1)(f)	Not compromise snow sports operations or functions	Most of the activity structures are situated along side or outside of existing ski runs and will result in no substantial change in snow sports operations. It is expected that some activity structures may require fencing or closures for public safety. The Building Design Review process and post-decision planning will evaluate consistency with direction; and

		<p>practicality, visibility and operational maintenance requirements for any closures.</p> <p>The activities will have little, if any, effect on the winter sports user experience given the location of this structure and the amount of other similar terrain available within the resort.</p>
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts	<p>While the activities will be primarily accessed through existing lifts, increased utilization of the existing Black Mountain Express is expected.</p> <p>No additional parking lots, lifts, or lodges will be required for this activity.</p>

### Additional Factors for Consideration

Additional factors that may affect whether these additional seasonal or year-round recreation activities and associated facilities meet FSM 2343 direction.

FSM Direction	Screening Considerations	Findings
2343.14 (4)	The degree to which visitors are able to engage with the natural setting, the extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands	<p>The design, setting and location of the canopy tour meets the intent and appropriateness criteria of agency direction.</p> <p>Visitors are able to engage with the natural setting to a high degree. The canopy tour allows little direct physical access to the natural environment since it is comprised of towers and users are fixed in their harnesses on fixed cables. However, the towers and cables are positioned within the canopy for most of the activity duration and provide guests with an intimate view of and closeness with the forest canopy and individual trees. With multiple stations and a much slower, guided route within the canopy, there is ample opportunity for guests to view, explore and learn about the forested setting. These natural resource assets are key part of the natural resource-based experience.</p> <p>The canopy tour is based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity (traversing and rappelling) itself replicates and is rooted in traditional climbing and mountaineering practices.</p> <p>Accessible design will improve the extent to which visitors are able to engage and explore other accessible opportunities on NFS lands. Interpretive signage and employee training can enhance this engagement can contribute to the exploration of other NFS lands.</p>
(5)	Interdependence of the visitor's experience with attributes common in National Forest settings	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

(7)	Encourage holder to utilize existing facilities to provide additional seasonal or year-round recreation activities	<p>The existing Black Mountain Express lift will be utilized in addition to existing parking lots, restaurants, roads and trails.</p> <p>No additional parking lots, lifts, or lodges will be required for these activities.</p>
-----	--------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------